



Running your business with LedgerSMB development

DRAFT / WORK IN PROGRESS
See the Preface for current status.

Erik Hülsmann Neil Tiffin
Chris Travers

<https://book.ledgersmb.org>

April 4, 2024

Contents

Preface	19
Organization of the book	19
Comments and questions	20
Acknowledgements	20
 I Overview	 21
 1 What is LedgerSMB	 23
1.1 Introduction	23
1.2 Supported functionality	24
1.3 Feature comparison with alternatives	25
1.4 System requirements	25
1.5 Application architecture	25
1.6 License	26
 2 Reasons to use LedgerSMB	 29
2.1 Internal control	30
2.2 Accounting principles	30
2.3 Impact of tight integration	30
 3 Introduction to accounting	 33
3.1 Double-entry accounting	34
3.2 Cash versus accrual basis	35
3.3 Valuation of inventory	36

II	Getting started	39
4	Overview	41
4.1	Introduction	41
5	Creating a company database	43
5.1	Using setup.pl	43
5.1.1	Step 1: setup.pl login	43
5.1.2	Step 2: Company creation	44
5.1.3	Step 3: Selection of a Chart of Accounts	45
5.1.4	Step 4: Load template	46
5.1.5	Step 5: Initial user	47
6	The first login	51
6.1	Introduction	51
6.2	Steps to the first login	51
6.2.1	Login screen	52
6.2.2	Selecting a password	52
6.2.3	Setting user preferences	55
6.2.4	Setting system defaults	56
6.3	Setting up a bank account or credit card	57
6.4	Checking and adjusting the chart of accounts	58
6.4.1	Accounts list	59
6.5	Checking sales tax rates	59
7	Building up stock	61
7.1	Overview	61
7.2	Defining parts	62
7.2.1	Single items	62
7.2.2	Combining single-item and “multi-item pre-packaged” sales	63
7.3	Defining part groups	63
7.4	Defining vendors	64
7.5	Requesting quotations	65
7.6	Following up on a quotation	66

<i>CONTENTS</i>	5
7.7 Receiving ordered items	67
7.8 Receiving an invoice	68
7.9 Paying an invoice	68
8 Ramping up to the first sale	71
8.1 Creating a customer	71
8.2 Sending out a quote	75
8.3 Sending out a sales order	75
9 Shipping sales	77
10 Invoicing	79
10.1 Handling sales taxes	79
10.1.1 Invoices with taxes included	79
10.1.2 Invoices with explicit tax amounts	79
10.2 Invoice Editing	79
11 Collecting sales invoice payments	81
11.1 Customer payments	81
11.2 Customer payment mismatch	81
11.2.1 Choosing between pardoning and registering underpay- ment	81
11.2.2 Large ones, as in partial payments or largish under/over payments	81
11.2.3 Pardoning small mismatches	81
12 Paying vendor invoices	83
12.1 Handling vendors who match amounts to exact invoices	83
12.2 Handling vendors with running balances	83
12.3 Handling bounced checks	83
12.3.1 Voiding checks to undo payments of vendor invoices re- lating to bounced checks	83
13 Monitoring arrears	85
13.1 Handling interest on arrears	85
14 Branching out: services	87

14.1	Creation / assignment to different accounts	87
14.2	Recording service hours	87
14.3	Customer approval on service hours	87
14.4	Invoicing services	87
15	Branching out II: service subscriptions	89
III	Configuration	91
16	Overview	93
16.1	Introduction	93
17	Global configuration	95
17.1	Apache	95
17.1.1	Differences between Apache 1.3 and 2+	95
17.2	PostgreSQL	95
17.3	LedgerSMB version numbers	96
17.4	LedgerSMB Configuration	96
17.4.1	ledgersmb.yaml	96
18	Per company configuration	101
18.1	Matching your business processes	101
18.2	Administrative user	102
18.3	Chart of Accounts	102
18.3.1	Predefined Chart of Accounts	102
18.3.2	Account structure	103
18.3.3	Account setup	104
18.3.4	Special accounts	108
18.3.5	Importing chart of accounts	109
18.4	System menu settings	109
18.4.1	Audit control	109
18.4.2	Taxes	110
18.4.3	Defaults	111
18.4.4	Year end	115
18.4.5	Admin users	115

<i>CONTENTS</i>	<i>7</i>
18.4.6 Chart of accounts	115
18.4.7 Warehouses	115
18.4.8 Departments	115
18.4.9 Type of business	115
18.4.10 Languages	116
18.4.11 Standard Industry Code (SIC)	116
18.4.12 Templates	116
 IV Administration	 119
19 Overview	121
19.1 Introduction	121
20 First Use	123
21 Within-application tasks	125
22 DBA tasks from setup.pl	127
23 Outside-application tasks	129
24 User management	131
24.1 Introduction	131
24.2 User creation	131
24.3 User authorization	132
24.4 Maintaining users	133
24.4.1 Editing user information and authorizations	133
24.4.2 Changing user preferences	134
24.4.3 Deleting users	134
24.5 User imports	135
24.6 setup.pl users	135
25 Definition of goods and services	137
25.1 Definition of goods	137
25.1.1 Definition of parts	137
25.1.2 Definition of part groups	140

25.1.3	Definition of assemblies	140
25.1.4	Definition of overhead or labor	140
25.1.5	The use of parts versus assemblies for multi-item-package sales	140
25.2	Definition of services	141
25.2.1	Taxation of services	141
25.3	Alternative accounts (GIFI)	141
25.3.1	Maintaining GIFI	141
25.4	Reporting	142
26	Taxes	143
26.1	Overview	143
26.2	Tax account configuration	143
26.3	Tax calculation examples	145
26.4	Tax calculation plug-ins	145
26.5	Tax forms	145
26.5.1	Overview	145
26.5.2	Creating tax forms	146
27	Pricing	147
27.1	Introduction	147
27.2	Definition of types of business	148
27.3	Definition of price groups	148
27.4	Using the price matrix	148
27.4.1	Price matrix example: simple pricing	149
27.4.2	Price matrix example: Quantity pricing	149
27.4.3	Price matrix example: Time-based (Sale) pricing	150
28	Auditing	151
29	Contingency planning	153
29.1	Backup and restore	153
29.1.1	Backup using setup.pl	153
29.1.2	Backup using PostgreSQL administration tools	153
29.1.3	Restore	153

<i>CONTENTS</i>	9
29.2 Advanced PostgreSQL: replication	153
30 Software updates	155
30.1 Introduction	155
30.2 Backups	155
30.3 Software upgrade	156
30.4 Database upgrade	156
31 Optional Features	157
31.1 PDF and Postscript Documents	157
31.2 Attaching Uploaded Files to PDF Invoices	158
31.3 OpenDocument Spreadsheet Output	158
31.4 Microsoft Excel Output	158
V Business processes	159
32 Overview	161
33 Customers and vendors	163
33.1 Introduction	163
33.2 Creating customers and vendors	163
33.2.1 Creating a Company	164
33.2.2 Creating a customer account	164
33.2.3 Creating a vendor account	166
33.3 Multiple customers within one company	166
33.4 Creating vendors from customers	166
33.5 Maintaining contact information	166
34 Quotations from Vendors and for Customers	167
34.1 Creating Quotations and RFQs	167
34.2 Expediting quotations	169
34.2.1 Printing	169
34.2.2 Sending by e-mail	169
34.3 Attaching files to quotations	169
35 Sales and vendor orders	171

35.1	Creating new orders	171
35.2	Creating orders from quotations	171
35.3	Creating orders from projects	171
35.4	Creating purchase orders from sales orders	171
35.5	Combining orders	171
35.6	Recurring orders	171
35.7	Incomplete orders	171
36	Inventory management	173
36.1	Shipping	173
36.1.1	Pick lists	173
36.1.2	Packing list	173
36.2	Receiving	173
36.3	Partial shipments or receipts	174
36.4	Handling returns	175
36.5	Transferring between warehouses	175
36.6	Inventory reporting	175
36.6.1	Inventory status report	175
36.6.2	Inventory activity report	175
37	Sales and vendor invoice handling	177
37.1	Creating invoices from orders	177
37.2	Creating new invoices	177
37.2.1	Invoices	178
37.2.2	Transactions	178
37.2.3	Email Invoices	178
37.3	Recurring invoices	178
37.4	Invalidating invoices	178
37.5	Correcting and deleting invoices	179
37.6	Handling invoice disputes	180
37.6.1	Credit and debit invoices	180
37.6.2	Credit and debit notes	180
37.6.3	AR and AP Vouchers	180
37.7	Remarks	181

<i>CONTENTS</i>	11
38 Shop sales	183
38.1 Opening and closing the cash register	183
38.2 Shop sales invoices	183
39 Manufacturing management	185
39.1 Producing sales orders	185
39.1.1 Work orders	185
40 Managing accounts receivable and payable	187
40.1 Creating generic AR/AP items	187
40.2 Handling refunds, over-payments and advances	187
40.3 Handling returns	187
41 Credit risk management	189
41.1 Introduction	189
41.2 Limit management	189
41.3 Granting payment terms	189
41.4 Managing arrears	189
41.4.1 Monitoring AR aging	190
41.4.2 Tracking invoice history	190
41.4.3 Special treatment of invoices	190
41.5 Interest on arrears	191
41.6 Allowance for doubtful accounts	191
41.7 Writing off bad debt	191
41.7.1 Direct write-off	191
41.7.2 Allowed-for write-off	191
42 Receipts and payment processing	193
42.1 Introduction	193
42.2 Single receipts or payments	193
42.3 Batch receipts and payments	194
42.4 Check payments	194
42.5 Using over payments	194
42.6 Receipt and payment reversal	195
42.7 Over payment reversal	195

42.8 Receipts and payments in foreign currencies	196
43 Accounting	197
43.1 Separation of duties: Transaction approval	197
43.2 Entering non sales transactions	197
43.2.1 Corrections	197
43.2.2 Transfer of money between bank accounts	197
43.2.3 Wages	197
43.2.4 Entering other general accounting documents	197
43.3 Bank reconciliation	198
43.3.1 Importing bank transactions - OFX	198
43.3.2 Importing bank transactions - CAMT.053	198
43.3.3 Importing bank transactions - CSV	198
43.4 Period closing	199
43.5 Year-end processing	199
43.6 Fixed asset accounting	200
43.7 Reporting	200
43.7.1 Tax reporting	200
43.7.2 Tax reporting using tax forms	201
43.7.3 Income statement	201
43.7.4 Balance sheet	201
43.7.5 Trial balance	201
 VI General Operation	 203
 44 User Interface	 205
44.1 Reports	205
 VII Customization	 207
 45 Overview	 209
45.1 Introduction	209
45.2 Workflow configuration	210
45.2.1 Workflow observers	211

<i>CONTENTS</i>	13
45.3 Document formatters	211
45.4 Bank statement importers	212
45.5 HTTP request interceptors	212
45.6 Outgoing mail transport	212
45.7 Sales/VAT tax calculation	213
46 Batch data import methods	215
46.1 Custom bank statement import	215
46.2 Chart of Accounts import	215
47 Add-ons and plug-ins	217
48 Company creation	219
48.1 Template sets	219
VIII Workflows	221
49 Overview	223
IX Appendices	225
A Differences between version 1.2 and 1.3	227
A.1 Users	227
B Why deleting invoices is not supported	229
B.1 Invoices are debt claims	229
B.2 Cost Of Goods Sold become ambiguous	229
C Installation	231
C.1 Docker preview	231
C.2 Docker Production	232
C.3 Native	232
C.4 Docker Development	235
C.5 Linux Distribution	235
D Migration	237

D.1	Introduction	237
D.2	From older LedgerSMB versions	238
D.3	From SQL-Ledger 2.8	238
D.4	From older SQL-Ledger versions	238
D.5	From other accounting packages	238
D.5.1	Overview	238
D.5.2	Migrating customers	238
D.5.3	Migrating parts, services,	239
D.5.4	Migrating the balance	239
D.6	Migrating between PostgreSQL versions	239
D.6.1	Notes on migration from PostgreSQL 8.3 (or earlier) to 8.4 - deprecated	241
E	Listing of application roles	243
F	Deprecated Content	253
F.1	ledgersmb.conf	253
G	Open source explained	257
G.1	An open source application	257
G.2	An open source book	257
H	Project history	259
I	Copyright and license	261
I.1	License summary	261
I.2	Legal full text	262
	Acronyms	270
	Acronyms	271
	Definitions of terms	273
	Definition of terms	273
	Index	276

List of Figures

5.1	setup.pl login screen	44
5.2	Chart of accounts - country selection	45
5.3	Chart of accounts - selection	46
5.4	Template selection	47
5.5	setup.pl initial user creation screen	48
5.6	setup.pl successful completion screen	49
6.1	login.pl opening screen	52
6.2	login.pl welcome screen	53
6.3	Password change screen	54
6.4	User preferences	55
6.5	System defaults	56
6.6	Bank account setup - menu items	57
6.7	Bank account setup - account setup screen	58
6.8	Tax rate adjustment screen	59
7.1	Add first part	62
7.2	Company entry screen	64
7.3	Vendor account screen	65
7.4	Vendor account screen - with purchase discount account	66
7.5	RFQ entry screen	67
7.6	RFQ e-mail screen	68
7.7	RFQ entry screen	69
7.8	Order receipt entry screen	69
8.1	Add contact screen	72

8.2	Credit account screen	73
8.3	Credit account 2nd screen	74
8.4	Addresses screen	74
18.1	Configure Account Hierarchy	103
18.2	Account Setup	104
18.3	Report Using Hierarchy	104
18.4	System Default Accounts	108
18.5	System templates screen	117
18.6	Templates edit invoice screen	118
24.1	Screen for user creation - step 1	132
24.2	Screen for user creation - step 2	133
24.3	User preferences screen	134
26.1	Tax account configuration screen	144
34.1	RFQ entry screen	167
36.1	Saved purchase order	174
36.2	Search screen for purchase order item receipts	175
36.3	Search results screen for purchase order item receipts	176
36.4	Purchase order receipt screen	176
43.1	Period and Year End Closing	199

List of Tables

5.1	Create first user entry data	49
6.2	First Login - Change initial password data	55
6.3	First Login - Change user defaults data	56
8.1	Company data	72
8.2	Credit Accounts data	73
8.3	First company address data	75
27.1	Customer specific price matrix	149
27.2	Price group specific price matrix	149
27.3	Price matrix configuration	149
27.4	Price matrix configuration	150

Preface

The current development goal for the book is to get the content current and accurate, not necessarily perfect structure and grammar.

You will find many incomplete sections which should be regarded as an outline for the finished book. However, some sections are nearly complete.

Because LedgerSMB is undergoing active infrastructure and API changes in 2024, some portions of this book will not be written until those changes are nearing completion.

Intended audience

The book has been split up into several parts intended for starting entrepreneurs, (potential) users, application integration developers and administrators, it offers something for everybody who works with or considers working with LedgerSMB.

Organization of the book

The first part ('Overview') is intended for everybody who tries to get an impression of LedgerSMB, with chapters on technology, features, licensing and a bit of project history.

The second part ('Getting started') leads new users and especially new entrepreneurs step by step through the application using a tutorial format. This part also contains additional explanations on good business and accounting processes.

The third part ('Configuration') describes system wide configuration settings such as the LedgerSMB configuration file and those required for dependencies like PostgreSQL. Additionally it describes the company specific settings within the application, such as audit control settings and required special accounts. This part is required material for anybody who wants to set up a LedgerSMB instance.

The fourth part ('Administration') discusses the different topics regarding application administration such as user management, product definition, taxes and etc. Anybody responsible for maintaining application instances in good health should read this part.

The fifth part ('Business processes') discusses LedgerSMB's best practices. This part is highly advised reading for everybody who is a LedgerSMB user and should be considered required reading for 'business architects': those in the company who decide about process design and execution.

The sixth part ('Customization') discusses how to customize the application. This part is intended for developers of custom extensions (such as company specific integrations), add-ons and plug-ins.

The last part ('Appendices') contain supplemental reference information on various subjects, such as a listing and description of the authorization roles in the application as well as information on migration to or upgrading of LedgerSMB versions.

Comments and questions

The sources of this book are being developed in the ledgersmb-book Github project at <https://github.com/ehuelsmann/ledgersmb-book>.

Comments and enhancement ideas can be filed in the ticket tracker of the project. Additionally, discussion about the content of the book can be organized on the mail list or chat channels listed at <https://ledgersmb.org/topics/support>.

Finally, up-to-date versions of this book in both PDF and HTML formats can be found on the book website at <https://book.ledgersmb.org>.

Acknowledgments

Håvard Sørli for his efforts to help develop the original book outline.

Members of the <https://app.element.io/#/room/#ledgersmb:matrix.org> chat room.

Part I

Overview

Chapter 1

What is LedgerSMB

1.1 Introduction

LedgerSMB is an open source, web based Enterprise Resource Planning system (ERP system). An Enterprise Resource Planning (ERP) is a system which supports business processes of all disciplines throughout the organization, automating as much of those processes as possible. To illustrate this, consider the process of selling goods to a customer in a trade company. Typically, a customer will request a quote, which Sales will provide. When satisfied he or she will convert the quote to an order. Sales will register the order, leading to order-pickers to collect one or more shipments. Upon completion, Finance sends out an invoice and records the customer's payment. LedgerSMB supports this process by automating the conversion from quotation to order, order to shipment and shipment to invoice, as well as providing pack lists and other production related documents.

LedgerSMB includes a powerful framework which supports building your own extensions and integrations with other applications. Through this philosophy, it aspires to be *the* (open source) integrated administration system.

The software is being developed by the LedgerSMB project with its homepage at <https://ledgersmb.org/>. However, the actual project activity can be witnessed at the Github project site hosted at <https://github.com/ledgersmb/LedgerSMB> and on the mailing lists or chat channel listed at <https://ledgersmb.org/topics/support>

Its open source nature allows you to download LedgerSMB and use it with any infrastructure you like. So there's no vendor lock-in: you can always take your data and set up your system with another hardware vendor or set up your own hardware.

1.2 Supported functionality

As most ERP systems LedgerSMB's functionalities are grouped into modules. Many modules are integrated parts of the base application. New features can be implemented in separate modules at first to allow evaluation of the feature set. When a it has become sufficiently stable, the new module may be integrated in the base application. As of that time, the existing features will be frozen, meaning that the utmost will be done to prevent it from being changed.

These separate modules - which are called add-ons - have to be installed separately. After installation they become seamless parts of LedgerSMB with no visible difference from the base application. An additional benefit of having add-ons is that they can follow different release schedules and separate maturity levels than the main application.

LedgerSMB development features the following integrated modules:

- General ledger
- Payment and Accounts payable
- Invoicing and Accounts receivable
- Fixed asset accounting
- Time registration and invoicing
- Point of Sale
- Quotation and Order management
- Manufacturing
- Inventory (warehousing) and shipping management
- VAT reporting
- Controlling
 - Project accounting
 - Department accounting
- Application administration

There are no known add-ons available at this time.

With this list of modules and add-ons LedgerSMB has been successfully implemented in a wide range of companies of varying types and sizes: shops, manufacturing companies and service oriented businesses up to as big as @@TODO million transactions, growing by 50,000 transactions (spread across AR, AP and GL) *per month*.

1.3 Feature comparison with alternatives

@@@ TODO

Packages to compare to:

- GNUcash
- OSfinancials
- ERP5
- Odoo
- xTuple

1.4 System requirements

The [README file](#) which comes with every LedgerSMB software release should be considered the canonical source for system requirements. In summary, the following technical components are required:

- A web server (known working are Nginx, Apache, lighttpd and Varnish)
- Modern Perl 5, with [additional modules](#)
- PostgreSQL 13 or higher
- (optional) L^AT_EX or X_YL^AT_EX from the Te_X or T_EXLive T_EX distributions

More information about system requirements for clients and servers is available at <https://ledgersmb.org/content/system-requirements>.

System requirements such as required RAM and number of CPUs and their speed largely depend on the expected system activity. However, any modern VPS should provide enough memory and storage to satisfy a reasonable number of users.

1.5 Application architecture

Due to its heritage from [SQL Ledger](#) and the on-going process of rewriting the inherited code, the architecture differs between parts of the application: the old parts and the ones which have already been rewritten.

Overall, the application consists of five layers:

- The web browser (as the user interface)
- The web server (as a network traffic handler)

- The Perl (web)server process (as an application - Perl Web Server Gateway Interface (PSGI))
- The database (as an application - PL/SQL)
- The database (as storage)

In version 1.10 the user interface is a Single Page Application using a mixture of new (e.g. [Vue 3](#), [webpack 5](#) and [Web Components](#)) and old (e.g. [Dojo Toolkit](#)) technology.

The web server is an optional component that's highly recommended for TLS termination and protecting the back end Perl HTTP server from malicious traffic¹. It may also be used for serving static page components such as images, style sheets and JavaScript component as an efficiency measure.

Recent releases add separation between business logic and process state with the latter being stored in the database and managed at the Perl layer. Other than that, it's the Perl layer's responsibility to forward web requests to the database and presenting the resulting data in response to the user interface. The original goal to reduce the Perl layer to be a "glue" layer between the web server and the database has been abandoned with the introduction of this additional (business process) layer.

At the "database as an application" layer, PL/SQL functions implement business functionality, such as creating cost of goods sold (COGS) accounting entries.

The "database as storage" layer is responsible for storing data with consistency and integrity; to that extent (and much more than in SL) constraints and triggers have been implemented. An additional role for the storage layer is to enforce data access rules; i.e. to protect data from being accessed by unauthorized users.

The main difference between old and new coding paradigms is at the Perl application layer: older code generates HTML fragments while newer code delivers data through web services. As part of the on-going code restructuring, there's a major effort to create a Representational State Transfer (REST) web service based APIs. The intent here is to facilitate integration with other applications used by businesses (both in the business itself or as provided by customers and vendors).

1.6 License

LedgerSMB is available under the terms of the *GNU Public License version 2*, in short: *GPLv2*².

¹This setup is an industry-wide accepted best practice for deploying web applications; web servers like Apache or Nginx have been and continue to be extensively security-reviewed. No other implementations can achieve the same level of scrutiny.

²<https://opensource.org/licenses/gpl-2-0/>

The project attaches the following meaning to this license: The copyright holders grant you the right to copy and redistribute the software. In case you make any modifications to the software you're obligated to publish the changes *if you distribute the software*. You are always free to provide third party access to the API from your modified software without being required to disclose your changes.

The project considers the API to include:

- Database tables
- URLs with their input and output
- Webservices of any kind
- Function and object calls

The effect of this interpretation is that changes directly to the code base as well as inheritance of classes defined in the software constitute "making modifications".

Chapter 2

Reasons to use LedgerSMB

Jack finds several tools which suit his requirements to some extent or another. After evaluation of his options he decides to use LedgerSMB for the following reasons:

- Centralized data storage
- Actively developed
- Development team with security focus
- Access to the application requires only a web browser
- Integrated sales, shipping, invoicing, purchasing and accounting
- Open source solution, so no vendor lock in
- The roadmap appeals to him, because it has web services payrolling on it
- There are multiple vendors offering commercial support, including hosted options
- The developers envision building a platform out of it: creating the building blocks required to build a company on
- Own your own data
- Freedom to change
 - Support organization
 - Developer (organization)
 - Data storage provider
 - Application service provider

2.1 Internal control

Internal control¹ helps organizations to prevent and detect fraud by introducing checks and balances to assess effectiveness and validity of transactions in the organization and thereby in its ERP system and accounting system(s).

2.2 Accounting principles

The accounting guidelines International Accounting Standards (IAS) and International Financial Reporting Standards (IFRS) describe requirements to financial statements (reports) and the underlying accounting process². Said requirements include qualitative characteristics:

1. Relevance
2. Faithful representation
3. Comparability
4. Verifiability
5. Timeliness
6. Understandability

While some - if not most - of these characteristics relate to the process of accounting, the “Verifiability” item clearly has an impact on the underlaying accounting systems: In order to be verifiable, there must be a clear audit trail to show the origin of the figures. To make sure users leave behind the required audit trail, some actions can’t be performed in LedgerSMB, even though it would seem to be a logical requirement to be able to do so - from the perspective of a non-accountant.

2.3 Impact of tight integration

While both the qualitative characteristics from IFRS and the checks and balances from the internal controls are pose restrictions on the accounting process, sometimes these restrictions require support from the underlying accounting software.

One example is the support for creating reliable audit trails by protecting accounting data from deletion. It’s important to realize the scope of accounting data in this respect: because invoices are being registered in the accounts receivable administration - which is summarized in the general ledger - they are part of the data for which the audit trail needs to be recorded.

¹See also https://en.wikipedia.org/wiki/Internal_control

²See also https://en.wikipedia.org/wiki/International_Financial_Reporting_Standards

Another example is separation of duties (also known as the “four eye principle”), where one accountant enters financial transactions and another is responsible for posting them. This procedure protects the company from an accountant single-handedly faking transactions and possibly masking fraud.

The requirements for good accounting processes and internal control have impact on the work flows supported by LedgerSMB. As a consequence some of the work flows described in part V may seem unwieldy; an example being the lack of functionality to delete or correct incorrect invoices (See Section 37.5 on page 179 for more details).

Chapter 3

Introduction to accounting

The purpose of an accounting system is to keep track of the company's financial status. The following reports are used to present it:

Balance Sheet

Provides a snapshot of the financial position of a company, listing its possessions (assets), debts (liabilities) and residual value (equity).

Income Statement

Also known as the "Profit & Loss Statement", summarizes the income generated over a specific period and the expenses associated with it, resulting in "Net Result".

Cashflow Statement¹

Summarizes the incoming and outgoing cash flows over a specific period, resulting in "Free Cash Flow".

Statement of Owner's Equity¹

Summarizes the changes in equity over a specific period.

Trial Balance

An intermediate report used for preparing the Balance Sheet and Income Statement, tallies transactions over the reporting period; used to assert that all accounts in the General Journal are balanced.

The accounting system is composed of these parts:

Journals

Contain the company's transactions with extensive additional data; they are the first point of entry for transactions, ordered by order of entry.

Ledgers

Contain aggregated data from the journals, ordered by date.

¹Not currently implemented in LedgerSMB

Chart of Accounts

The categories by which financial data are classified.

All accounting data ends up summarized in the GL. Transactions may be entered in a different (sub)ledger before ending up in the GL; e.g. the Sales Ledger. With the advent of computerized accounting, the use of journals is in decline: transactions are classified while directly being entered into ledgers.

In addition to the parts mentioned above the following terms are used throughout this document:

Assets

Money and anything that can be converted into money without reducing the net equity of the business. Assets include money owed, money held, goods available for sale, property, etc.

Liabilities

Debts owned by the business such as bank loans and unpaid bills.

Equity

What would be left for the owner if all the assets were converted to money and all the liabilities paid off.

Revenue

Income from business activities.

Expense

Money paid to operate the business.

Cost of Goods

Money that was spent to acquire material and services to build a product being sold.

Operating Expenses

Expenses that are consumed to administer the business.

Accounts Receivable

An asset on the books as a claim for a future payment from a customer.

Accounts Payable

A liability on the books for a future payment to a supplier or vendor.

3.1 Double-entry accounting

The basic concept in double-entry accounting is that every transaction is an exchange. For example, when a business sells goods to a customer, it issues an invoice. The exchange is to provide the goods and receive the right for (future) payment. When the customer later pays the invoice, the right for payment is exchanged for cash.

Each exchange is to have the same value on both sides of the exchange, making sure no transaction is incomplete. This is where the requirement comes from

that double-entry transactions need to be balanced. It can occur that a customer's payment is a bit short of the owed amount. Should the company decide not to pursue payment, the transaction would end up being unbalanced. After all the exchange is not equal-value between the providing and receiving sides. Double-entry accounting accommodates this scenario by explicitly recording the unpaid amount as an expense.

Because every transaction is balanced, so is the balance sheet. Through this approach, double-entry accounting provides strong control over correctness of the numbers: as soon as a transaction is unbalanced (i.e. contains an error), the balance sheet becomes unbalanced – a relatively simple check.

3.2 Cash versus accrual basis

Financial statements, such as the Income Statement and Balance Sheet can be prepared using either a cash or accrual basis.

In cash basis accounting, the income is deemed earned when the business physically receives the customer payment, and the expenses are deemed incurred when the business physically pays them. Cash basis accounting does not require the use of purchase orders, invoices, or long term liabilities.

In accrual basis accounting, income is considered earned when a valid asset is received for services or product provided. The asset is the claim on the customer, by way of the invoice, to collect an amount at a later date. This asset is called Accounts Receivable. An expenses is considered earned when a liability is created, by way of a purchase order, to the supplier or vendor. The liability is the commitment to pay the supplier or vendor at a later date. This liability is called Accounts Payable. Accrual basis accounting requires the use of invoices and purchase orders.

There can be a number of problems with cash basis accounting:

- No visibility in the accounting system regarding your cash commitments leading you to think you have more or less money to spend than you actually have.
- No visibility in the accounting system about unpaid customer debts.
- Your taxing jurisdiction may limit businesses that can use cash basis accounting. For example in the United States, if you sell products or services on credit, have gross receipts higher than allowed, or need inventory to account for income.
- Because cash basis accounting isn't part of any accounting standards, there are varying expectations of what a cash balance or income statement looks like.

3.3 Valuation of inventory

@@@ TODO Need why is this important paragraph?

The cost of inventory, in theory, includes all costs incurred to acquire the goods and make them ready for sale. This theoretical cost may include shipping costs, discounts, insurance, receiving costs, handling costs, storage costs, etc.

In practice, the cost used is often limited to the total invoice price for the goods. This formula may or may not include shipping and handling. Other costs are often ignored if they are immaterial to the overall cost of the inventory, if there is no easy way to allocate the costs to the inventory, or they are relatively constant period to period.

Inventory valuation must consider in the following situations:

- When the valuation of inventory varies from purchase to purchase. The costing method determines the valuation. This situation is automatically handled in LedgerSMB using one of the inventory valuation methods discussed below.
- When the valuation of inventory is less than what was paid for it. The inventory must be written down. This is usually a manual calculation that is the result of damage, obsolescence, or decline in the vendor or suppliers selling price.
- When estimates are required, such as when inventory is stolen, destroyed, or when a physical inventory cannot be performed. In this case, a reasonable and consistent manual method must be used to estimate the value.

There are several general automated inventory valuation methods including the following:

- Specific Identification – Each specific inventory item has its cost tracked individually. This method is usually used for large and expensive items that can be tracked by serial number or identification tag. Typically, the specific identification inventory valuation method results in an inventory valuation close to value of using the First in, first out (FIFO) method.
- FIFO – This method is similar to selling the oldest product first merchandising policy. In the FIFO method the latest costs are included in inventory cost and the older costs are charged back to COGS.

FIFO is the preferred method for maintaining accurate historical costs and is less susceptible to income manipulation by the timing of new purchases. Typically FIFO results in the highest inventory value of these methods.

In LedgerSMB the inventory cost is tracked on a FIFO basis. When a part is purchased, its cost is added to the inventory asset account. When the part is sold, the cost of the item is moved to the cost of goods sold account.

@@@TODO Is this paragraph redundant?

@@@TODO What cost is used; oldest, newest, average?

@@@TODO How is the inventory asset account debited?

- Last in, first out (LIFO) – Under LIFO the costs of the last goods purchased are charged against revenues as the COGS and the inventory is composed of the costs of the oldest goods acquired.

LIFO is preferred when prices are rising as it typically results in reducing net income and thereby reducing taxes. However, LIFO allows manipulation of income by simply changing the time at which additional purchases are made and does not represent accurate historical costs. Typically LIFO results in the lowest inventory value.

- Weighted Average – Under the weighted average method, the total number of units purchased plus those on-hand at the beginning of the period is divided by the total costs of purchases plus the cost of the beginning inventory.

Typically the weighted average inventory valuation method results in an inventory value between FIFO, which is the highest, and LIFO which is the lowest.

Part II

Getting started

Chapter 4

Overview

This part of the book will run the reader through the LedgerSMB using an example startup company run by Jack: Example Inc, which starts its life as a computer parts store for the business-to-business market.

4.1 Introduction

Jack just completed incorporation of Example Inc and is ready to start doing business. Before starting his operation Jack was looking for tooling to run his operation efficiently. To that extent he'll be running LedgerSMB using the domain he acquired for his business: <https://example.com/>.

The other chapters in this part of the book show you what steps Jack has to go through to get LedgerSMB up and running for Example Inc., as well as the steps he has to take to keep LedgerSMB in good health.

Due to its success Example Inc. will grow, posing new challenges to LedgerSMB and we'll show you how Jack can change the configuration to adapt to his growing business's needs.

Jack chooses to use a hosted LedgerSMB, so he doesn't need to concern himself with the technical details of getting the application up and running. Instead he can start by setting up the company database immediately.

In Chapter 5 starting at page 43 and Chapter 6 starting at page 51 Jack goes through the steps of setting up a basic company. The chapters after that may not apply to every business. Chapter 7 starting at page 61, Chapter 8 starting at page 71 and Chapter 9 starting at page 77 apply to businesses dealing with physical goods: buying, selling and shipping. Chapter 37 starting at page 177 discusses how to handle invoicing from LedgerSMB. Chapter 11 starting at page 81, Chapter 12 starting at page 83 and Chapter 13 starting at page 85 discuss how to manage accounts receivable and payable including arrears monitoring.

Not all chapters may be relevant to the reader, e.g. when he or she is starting up

or running a services company in which case the chapter “Building up stock” doesn’t apply. Chapters can be skipped based on relevance both to the type of business and its growth phase.

@@@ more chapters??

Chapter 5

Creating a company database

5.1 Using setup.pl

LedgerSMB comes with a tool called `setup.pl`. It's the beginning of a web-based ¹ database administration interface to LedgerSMB. This tool can be used to create company databases as well as backups of existing ones.

Please note that while executing the steps described in this section, it may take a while for the next screen to appear after clicking each button: Some buttons involve a large amount of server processing before the next screen can be presented.

5.1.1 Step 1: setup.pl login

Jack installed LedgerSMB using the default installation instructions, which means the url for his `setup.pl` is <https://example.com/setup.pl>. Figure 5.1 on page 44 shows the login screen for the tool.

Please note that in version 1.7 and earlier you can't be logged into the administration tool (`setup.pl`) and the webapp through the same browser at the same time due to limitations of the implementation.

The login screen shows three fields: (a) a user, (b) a password and (c) a database name.

The user name you use with `setup.pl` needs to be a PostgreSQL user. The user needs at least the right to create databases and other users; the `postgres` super user has these rights and more, so it's generally convenient (but not very secure) to use it.

¹There's also a command line based setup tool called `ledgersmb-admin`; it's covered as part of the section 'Administration'

The password must be the same as that used to log in from the command line using the `psql` tool or the password you assigned on user creation using the `createuser` tool ². Both `psql` and `createuser` are PostgreSQL tools (not LedgerSMB tools).

The third field is the name of the company database to be created. For practical reasons it's best to use only lower case letters, numbers and the underscore (`_`).

The “Login” button is used when the company database already exists. The user can then perform some administrative tasks on the existing database.

The “Create” button is used to create a new company.

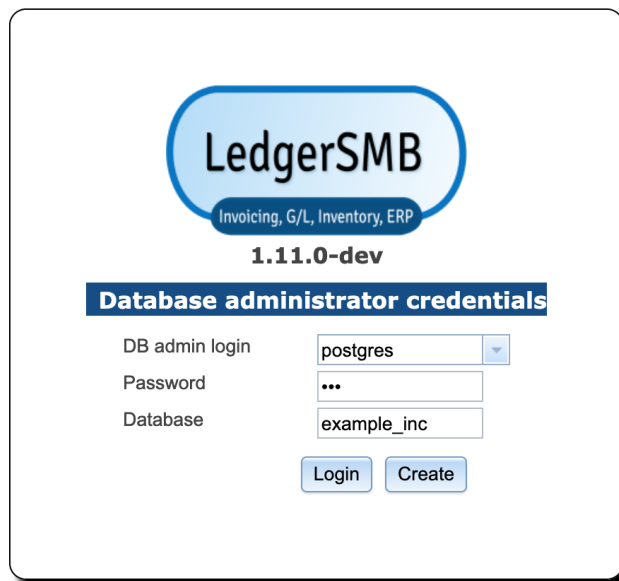


Figure 5.1: setup.pl login screen

5.1.2 Step 2: Company creation

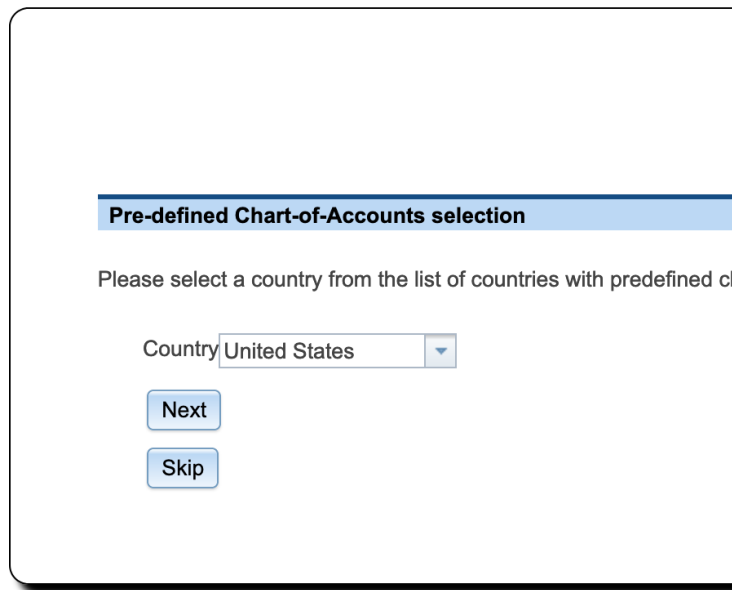
When creating a company database, there are a few things that are of importance:

- The name of the company database will be used at login time and hence will be used by all users - a choice of recognizable value is important
- The value entered (and hence the company name) is case-sensitive
- The name can't be more than 63 characters long

²Most PostgreSQL deployments need configuration changes for this to work, if you're installing LedgerSMB yourself. See <https://ledgersmb.org> for installation instructions.

After choosing “example.inc” as his company name, Jack clicks “Create” to create the database and load it with LedgerSMB’s database schema, authorization rules and stored procedures³. It may take a while (30 seconds or more) for the next screen to appear⁴.

After the delay the screen from Figure 5.2 on page 45 shows up.



Pre-defined Chart-of-Accounts selection

Please select a country from the list of countries with predefined ch

Country

Figure 5.2: Chart of accounts - country selection

5.1.3 Step 3: Selection of a Chart of Accounts

LedgerSMB comes with numerous predefined charts of accounts. These have been grouped per country making the selection of a chart a two-step procedure. `setup.pl` allows for users wanting to define their own charts by offering a “Skip” button. This button skips the process of loading a chart.

Note that you need to define a chart of accounts before you can meaningfully do anything inside LedgerSMB. If you don’t load a pre-defined one you’ll need to create or upload your own from inside the application once setup has completed.

Figure 5.3 on page 46 shows the first screen in the CoA selection procedure.

³Parts of the program inside the database.

⁴Note that during the creation of the database, logs are kept so that in case of errors these can be reviewed either by the person running the installation or by support personnel. On Linux/Unix systems these are stored, by default, in the “/tmp/ledgersmb/” directory and named “dblog”, “dblog.stderr” and “dblog.stdout”.

Here you select the country for which you want to use the CoA. Note that charts of accounts are highly country dependent and you may want to consult an accountant if no default chart of accounts is included for your country.

As Jack runs his company in the United States, that's what he selects.

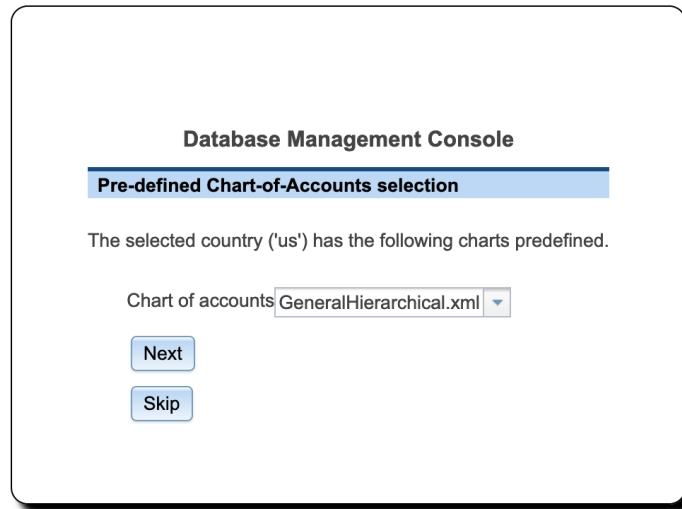


Figure 5.3: Chart of accounts - selection

Figure 5.4 on page 47 shows the second screen in the chart of accounts selection procedure. The drop down contains a list of all charts of accounts defined for the selected country.

Jack selects the `GeneralHierarchical.xml` chart of accounts: that will leave him enough room to specialize the setup later if he has to, but for the time being offers a broadly usable setup.

5.1.4 Step 4: Load template

LedgerSMB comes with a set of default reporting templates. These control the formatting of documents like invoices, checks, balance sheet, purchase orders, income statement, etc. Jack is now presented with the screen to load templates. LedgerSMB development comes with a single choice⁵:

- demo – Example template set for various output formats including PDF, HTML and Excel

⁵Administrators may define extra sets for users to be selected upon company creation; see 48.1

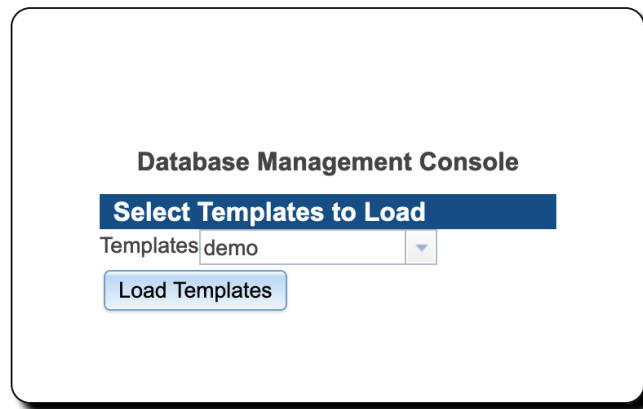


Figure 5.4: Template selection

5.1.5 Step 5: Initial user

In the previous step, the technical part of the company creation procedure was completed. However, it's not possible to log in to the company yet. Figure 5.5 on page 48 shows the next step in the setup process: the user creation screen. The fields shown have the same meaning as those discussed as part of user management in Section 24.2 on page 131.

Database Management Console

Enter User

Username:

Password:

User creation: ☒ Create new user ☐ Import existing user

Salutation: ▼

First Name:

Last name:

Employee Number:

Date of Birth: ▼

Tax ID/SSN:

Country: ▼

Assign Permissions: ▼

Figure 5.5: setup.pl initial user creation screen

Jack chooses to create an administrative user called `admin` who will be authorized to do everything in the application. Later on he will also create a user `jack` who will be authorized to do everything but changing the configuration and doing application administration. He'll use the latter user to log in for day to day operations. This will help him prevent changing settings by accident.

Note that none of the fields in this screen are optional. If the name of the user being created isn't already used with other companies, leave the `Import` option set to `No`, otherwise please read the chapter on user creation mentioned above.

Note: The password you enter here is a temporary one which will remain in effect **for 24 hours only**. Be sure to execute the steps in Section 6.2 on page 51 before these 24 hours elapse, because the user will be disabled after that.

Jack proceeds to enter the values as follows:

Field	Value	Description
User Name	admin	The login user name
Password	asdfg	The password to use for your first login
Create New User	Checked	
Import Existing User	Unchecked	Only used when the user exists in another database

Field	Value	Description
Salutation	Mr .	
First Name	Ad	Used in combination with Last Name to identify the user
Last Name	Min	
Employee Number	1	
Date of Birth	1/1/2000	not used by the application
Tax ID/SSN	0	Tax or SSN; not used by the application
Country	United States	
Assign Permissions	Full Permissions	

Table 5.1: Create first user entry data

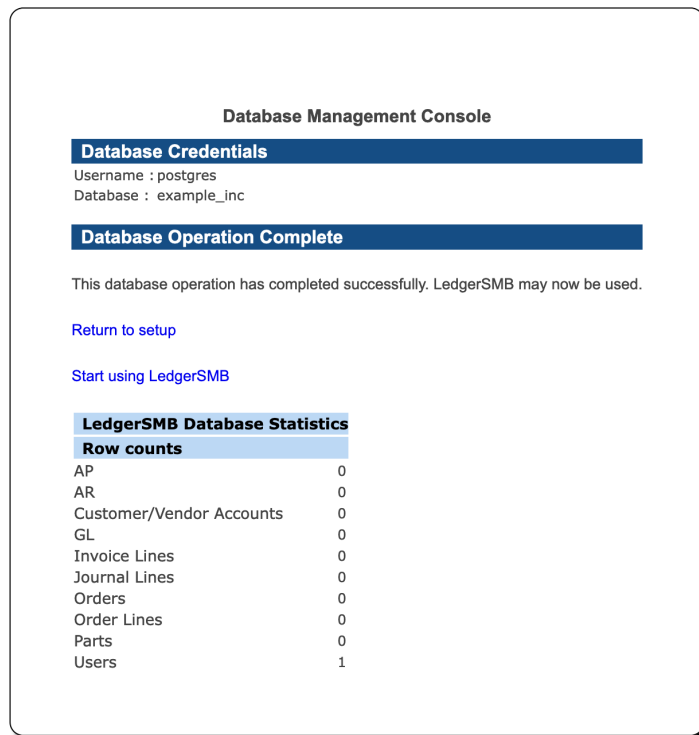


Figure 5.6: setup.pl successful completion screen

Jack has created his company database and now sees the “Database Management Console” screen as shown in Figure 5.6 on page 49.

By selection `Start using LedgerSMB` in the “Database Operation Complete” section of the screen his story continues in the next chapter “The first login”.

Chapter 6

The first login

6.1 Introduction

After the company database has been created by executing the procedure described in the last chapter it is still an empty shell which needs to be populated. The correct data needs to be entered for things like bank accounts and company contact data to be used on invoices.

These steps have to be completed before LedgerSMB can be used meaningfully: these settings have to be present for many workflows. A major reason is that with LedgerSMB - as most ERP system - financial consequences of events in many workflows are directly reflected in the company's books. Some accounting related settings have to be completed before LedgerSMB can do so.

This chapter documents the steps to create a basic usable configuration for Example Inc. It assumes that one of the default chart of accounts was selected as shown in Chapter 5 starting at page 43 or that a custom chart of accounts was imported using the instructions in Section 18.3.5 on page 109. Whatever method was chosen, this chapter assumes that a chart of accounts is available.

6.2 Steps to the first login

Jack is ready for his first login and should see the screen as shown in Figure 6.1 on page 52.

If this screen is not shown then Jack navigates to <https://example.com/ledgersmb/login.pl> to access the login screen.

6.2.1 Login screen



Figure 6.1: login.pl opening screen

The login screen shows three fields which Jack proceeds to fill in as follows:

Field	Value	Description
Name	admin	The login user name
Password	asdfg	The password to use for your first login
Company	example_inc	The name of the company database

After entering all of the information and tapping the `Login` button Jack will see an alert letting him know that his password will expire today. Jack clicks OK to dismiss the alert.

6.2.2 Selecting a password

After successful login, the system shows the Welcome to LedgerSMB screen as depicted in Figure 6.2 on page 53.

The initial password has a 24-hour validity limit to prevent unused user accounts from posing a security risk.

To set a new password Jack navigates to `Preferences → Password` and sees the screen as depicted in Figure 6.3 on page 54.

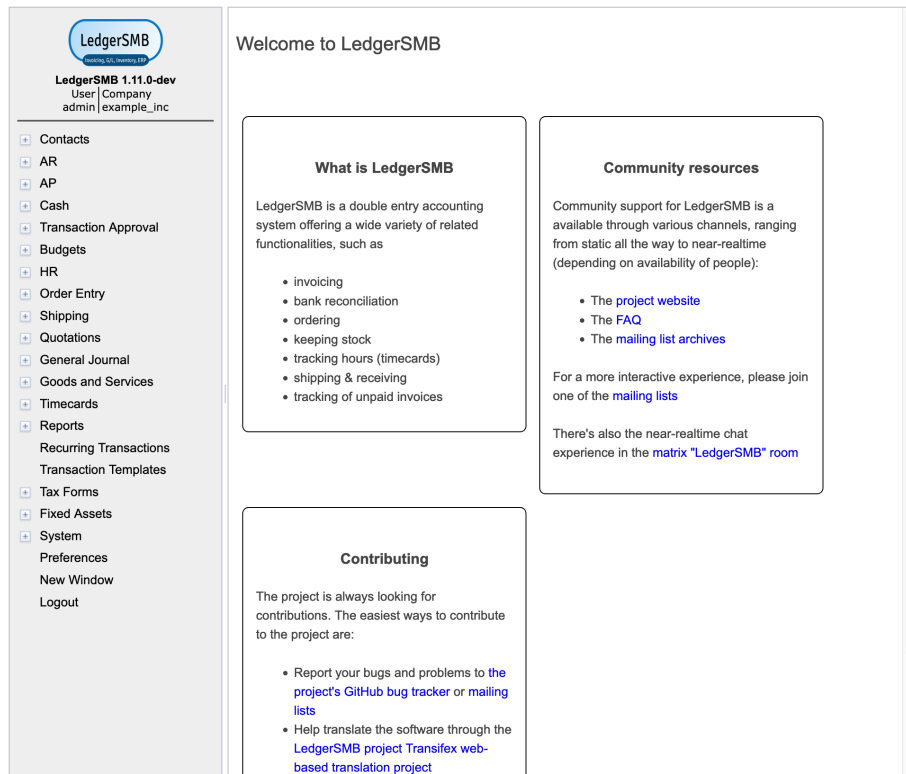


Figure 6.2: login.pl welcome screen

The new password that Jack chooses will be different than any password used before and different than the temporary password set by the administrator. Not clicking the `Save` button means the password remains unchanged and the 24-hour limit remains in effect.

Preferences Password

Change Password

Old Password
.....

New password
.....

Strength 25

Verify
.....

Change Password

Figure 6.3: Password change screen

Jack enters the information in the Change Password screen as follows:

Field	Value	Description
Old Password	asdfg	The old password set by the administrator using setup.pl
New Password	lkjhg	The new password that Jack wants to use for admin
Verify	lkjhg	Repeats the new password that Jack wants to use for admin

Table 6.2: First Login - Change initial password data

Jack then clicks the `Change Password` button.

The new password has a validity of determined by the `Password Duration` setting from the `System → Defaults` screen. User management is discussed in detail in Chapter 24 starting at page 131.

Login will be denied to users with expired passwords; they can request password resets through user admins.

6.2.3 Setting user preferences

Jack clicks on the tab `Preferences` and the system shows the `Preferences` screen as depicted in Figure 24.3 on page 134

Figure 6.4: User preferences

Jack selects his language, in this case American English and clicks Save.

6.2.4 Setting system defaults

Out of the box, LedgerSMB contains reasonable system defaults, but Jack needs to add some specific company information. In order to do so, Jack navigates to System → Defaults and sees the screen depicted in Figure 6.5 on page 56.

System Defaults

Company Information

Company Name

Example Inc.

Company Address

215 Example St
Any City, CA

Company Phone

555 836 2255

Company Fax

Business Number

12345

Default Email To

Default Email CC

Default Email BCC

Default Email From

info@example.com

Company Sales Tax ID

Company License Number

Base Currency

USD

Weight Unit

lbs

Default Country

United States

Default Language

English

Default Format

HTML

Default Paper Size

Letter

Security Settings

Disable Back Button

Yes ☐ No ☒

Password Duration (days)

180

Session Timeout (e.g. "90 minutes")

Separate Duties

Yes ☒ No ☐

Lock Item Description

Yes ☐ No ☒

Gapless AR

Yes ☐ No ☒

Default Accounts

Current earnings

3999 -- NET MARGIN

Inventory

1510 -- Inventory

Income

4010 -- Sales

Cost of Goods Sold

5010 -- Purchases

Figure 6.5: System defaults

Jack sets the following defaults:

Field	Value	Description
Company Name	Example Inc.	
Company Address	215 Example St Any City, CA	Note the use of the new line
Company Phone	555 836 2255	
Business Number	12345	e.g. Chamber of commerce number
Default Email From	info@example.com	
Default Country	United States	
Default Language	English (US)	
Password Duration	180	Days

Table 6.3: First Login - Change user defaults data

Then clicks the Save button at the bottom of the screen.

A more elaborate description of the parameters in this screen is provided in subsection 18.4.3.

6.3 Setting up a bank account or credit card

As part of the start up activities of his company, Jack comes to an agreement with the bank for three products:

- A current account with number “C54769”
- Deposit account with number “D54990”
- Credit card with a number ending with “.7734”

Most accounting systems - LedgerSMB included - use separate GL accounts to represent each bank account. This allows easy reconciliation of the ending balance on the bank account with the balance in the books.

Knowing this, Jack looks up the example bank account from his preconfigured US chart of accounts using the General Journal → Chart of Accounts menu as shown in Figure 6.6 on page 57.

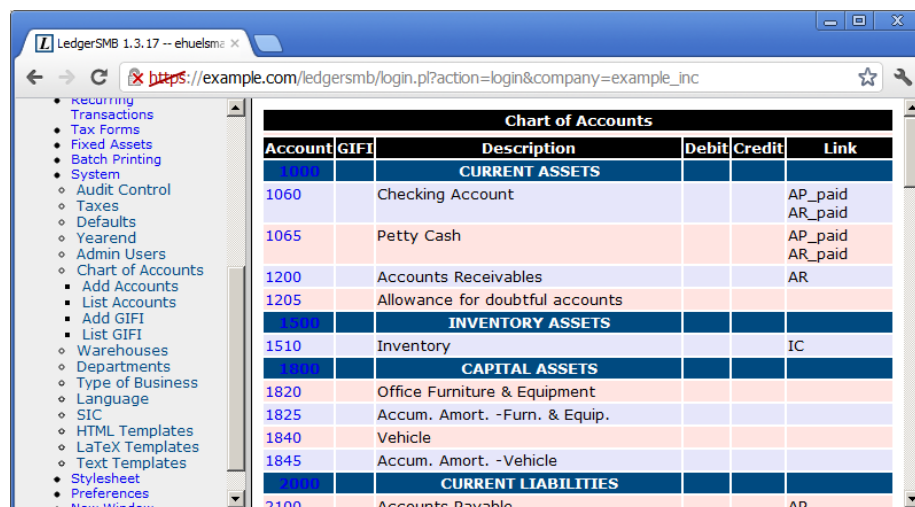


Chart of Accounts					
Account	GIFI	Description	Debit	Credit	Link
CURRENT ASSETS					
1060		Checking Account			AP_paid AR_paid
1065		Petty Cash			AP_paid AR_paid
1200		Accounts Receivables			AR
1205		Allowance for doubtful accounts			
INVENTORY ASSETS					
1510		Inventory			IC
CAPITAL ASSETS					
1820		Office Furniture & Equipment			
1825		Accum. Amort. -Furn. & Equip.			
1840		Vehicle			
1845		Accum. Amort. -Vehicle			
CURRENT LIABILITIES					
2100		Accounts Payable			AP

Figure 6.6: Bank account setup - menu items

Jack adds the new bank accounts by doing the following:

1. Click on “1060”
2. The screen appears as shown in Figure 6.7 on page 58 appears
3. Change the Description “Checking Account” to “Checking Account C54769”
4. Click “Save”

5. In the same screen change the Account Number to “1061”
6. Change the Description to “Cash Deposit Account D54990”
7. Click “Save as new”
8. In the same screen change the Account Number to “1062”
9. Change the description to “Credit Card xxxx.xxxx.7734”
10. Click “Save as new”

Section 18.3.3 on page 104 discusses the options in detail - for now using the settings as configured for the sample checking account will do.

Report Name: Chart of Accounts Company: jack						
Account Number	Description	GIFI	Debits	Credits	Dropdowns	Delete
1000	ALL ASSETS		0.00	0.00		
1050	CURRENT ASSETS		0.00	0.00		
1060	Checking Account		0.00	0.00 AR_paid AP_paid		[Delete]
1065	Petty Cash		0.00	0.00 AR_paid AP_paid		[Delete]
1200	Accounts Receivables		0.00	0.00 AR		[Delete]
1205	Allowance for doubtful accounts		0.00	0.00		[Delete]
1500	INVENTORY ASSETS		0.00	0.00		
1510	Inventory		0.00	0.00 IC		[Delete]
1800	CAPITAL ASSETS		0.00	0.00		
1820	Office Furniture & Equipment		0.00	0.00		[Delete]
1825	Accum. Amort. -Furn. & Equip.		0.00	0.00		[Delete]
1840	Vehicle		0.00	0.00		[Delete]
1845	Accum. Amort. -Vehicle		0.00	0.00		[Delete]
2000	ALL LIABILITIES		0.00	0.00		
2050	CURRENT LIABILITIES		0.00	0.00		
2100	Accounts Payable		0.00	0.00 AP		[Delete]
2110	Accrued Income Tax - Federal		0.00	0.00		[Delete]
2120	Accrued Income Tax - State		0.00	0.00		[Delete]
2130	Accrued Franchise Tax		0.00	0.00		[Delete]
2140	Accrued Real & Personal Prop Tax		0.00	0.00		[Delete]
2150	Sales Tax		0.00	0.00 AR_tax AP_tax IC_taxpart IC_taxservice		[Delete]
2160	Accrued Use Tax Payable		0.00	0.00		[Delete]
2210	Accrued Wages		0.00	0.00		[Delete]
2220	Accrued Comp Time		0.00	0.00		[Delete]
2230	Accrued Holiday Pay		0.00	0.00		[Delete]
2240	Accrued Vacation Pay		0.00	0.00		[Delete]
2310	Accr. Benefits - 401K		0.00	0.00		[Delete]
2320	Accr. Benefits - Stock Purchase		0.00	0.00		[Delete]
2330	Accr. Benefits - Med, Den		0.00	0.00		[Delete]
2340	Accr. Benefits - Payroll Taxes		0.00	0.00		[Delete]
2350	Accr. Benefits - Credit Union		0.00	0.00		[Delete]
2360	Accr. Benefits - Savings Bond		0.00	0.00		[Delete]
2370	Accr. Benefits - Garnish		0.00	0.00		[Delete]
2380	Accr. Benefits - Charity Cont.		0.00	0.00		[Delete]
2600	LONG TERM LIABILITIES		0.00	0.00		
2620	Bank Loans		0.00	0.00		[Delete]
2680	Loans from Shareholders		0.00	0.00 AP_paid		[Delete]

Figure 6.7: Bank account setup - account setup screen

6.4 Checking and adjusting the chart of accounts

First and foremost the chart of accounts serves to register income, expenses, assets and liabilities in categories which support financial decision making or regulatory requirements. When checking his chart of accounts, this is the first thing Jack checks for.

Many business events in LedgerSMB trigger the creation of financial transactions. If the configuration required for these transactions to be created isn't in place, users won't be able to complete their workflows.

6.4.1 Accounts list

Jack wants to make sure his chart of accounts fits his purposes. To perform these checks Jack goes into the `General Journal` → `Chart of Accounts` page. For now, he finds the ledger to be in order. Although the single Sales account stands out a bit against the numerous expense accounts, it turns out that there is also a single Purchases account on which all the expenses for parts purchases are going to be booked.

He decides that if this isn't enough, he can add accounts later.¹

6.5 Checking sales tax rates

First off, Jack asserts that a sales tax² account has been provisioned. He finds it in the Current Liabilities section of his Chart of Accounts (CoA). In his jurisdiction there is only one sales tax rate applicable at any one time, which means this single account will suit his needs just fine. If he had been in a jurisdiction with multiple tax rates applicable, e.g. different rates for different types of goods, he would have been required to create more accounts.

The procedure to create more sales tax accounts is the same as the one used in Section 6.3 on page 57, with the notable difference that this time the base account to be used is the sales tax account.

With the accounts in place, the tax rates have to be checked and possibly adjusted. To do so, Jack navigates to the `System` → `Taxes` page as shown in Figure 6.8 on page 59.

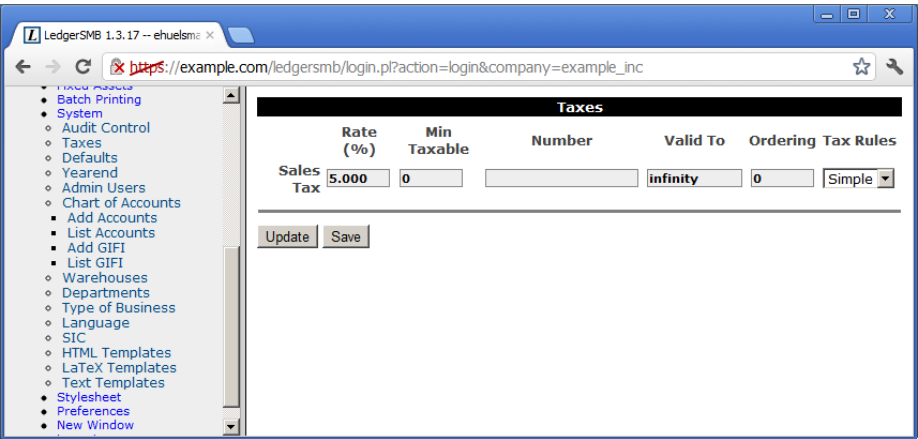


Figure 6.8: Tax rate adjustment screen

The rate shown (5%) is exactly what Jack needs. The procedure to set rates is a

¹Note that Jack will discover in Section 7.4 on page 64 that he does indeed need to create additional accounts to support sales and purchase discounts.

²Sales tax may be called Value Added Tax (VAT) in some jurisdictions.

bit long to describe and hence has its own chapter. Please refer to Chapter 26 starting at page 143 for details on how to change taxes.

Chapter 7

Building up stock

7.1 Overview

In this chapter Jack goes through the process of setting up LedgerSMB for his trade activities in computer parts, which includes deciding which parts he wants to resell. From there on he goes to contact a vendor to request a quotation, convert that to an order and receive goods into inventory and invoices into accounts payable.

To prepare LedgerSMB for his parts sales and purchases, Jack needs to configure Parts. The system records inventory for parts and assemblies. Jack won't use them for his business. There's more on assemblies in Section 25.1.3 on page 140.

Once set up, Jack is ready to execute the ordering process. Even though the process is described here from a purchasing perspective, sales work the same way with the roles reversed (Jack will act as a vendor in the sales process).

To start his purchase, Jack creates a Request for quotation (RFQ) document which he sends one or multiple vendors to let them know he's interested in their products.

The vendor responds to Jack's request by issuing a Quotation. From a legal perspective a quotation is a document which promises to deliver the requested goods or services at a certain rate - subject to conditions specifically mentioned. If Jack accepts the quotation and meets the conditions, the vendor is obligated to deliver.

In response to the quotation, Jack will place an order with the vendor to indicate acceptance of the quotation (or he can let it expire). When he places the order, that legally means he agrees to the terms and conditions in the quotation. If the vendor delivers the goods or services as per the order, Jack has accepted the legal obligation to pay.

The vendor responds to the order by shipping the goods and services as well as sending an invoice. The invoice legally means the vendor considers to have a

claim on the assets of Jack’s company. Jack creates a vendor invoice in his system to record the claim on his company by the vendor and the vendor creates a sales invoice in their system to do the same.

As a result of the above it’s considered bad practice to delete or change invoices once created. The accepted process to adjust invoices is to generate a debit invoice (for purchases) or a credit invoice (for sales) to “undo” the effects of the invoice and letting the other party know about it. Then a new invoice can be generated with the appropriate content. However, when the order process is correctly followed from order to invoice chances of sending the wrong invoice are greatly reduced.

7.2 Defining parts

Jack needs to enter a large number of items he’ll be offering in his new shop. He starts out with the easy ones: the ones which will be sold as single items.

7.2.1 Single items

Jack chooses a 5TB hard drive by Samsung to be entered into the system as the first item. To do so, he goes to the Goods and Services → Add part page from the menu as shown in Figure 7.1 on page 62.

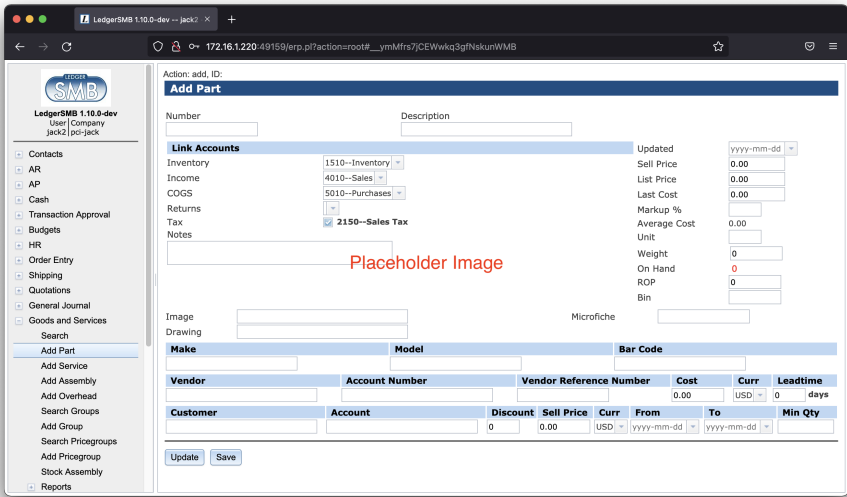


Figure 7.1: Add first part

Based on his reading from Section 25.1.1 on page 137, Jack decides to enter the hard drive with the following data:

Field	Value
Number	SAM1TB
Description	SAMSUNG 980 PRO 1TB PCIe NVMe Gen4 SSD
Inventory account	1510 - Inventory
Income account	4010 - Sales
COGS account	5010 - Purchases
Sell price	175.00

After entering the data Jack clicks *Save*.

He decides not to include make/model information, drawings or images yet and since he hasn't entered vendors or customers in his system yet, he decides to leave those sections blank as well.

7.2.2 Combining single-item and “multi-item pre-packaged” sales

After having finished setting up the solid state drive, Jack now wants to enter the memory modules he's going to sell. The problem is that they usually go in pairs, since that's what the systems consuming them need. However, he expects them to be sold as single items as well and he wants to be able to set a separate price for those occasions.

From his reading of Section 25.1.5 on page 140, it should be possible to support this scenario with a small work around¹. From the two solutions available, he chooses option (b): to create a part and an assembly and regularly restock the assembly to 0 (zero) in order to remove the stock from the single item.

7.3 Defining part groups

As Jack continues to enter more parts into the system, he wonders how he's going to look up the parts efficiently later on. Returning his reading to Section 25.1.1 on page 137, he understands that 'part groups' are the solution to that problem.

He decides to create the part groups by navigating to:

Goods and Services → Add Group.

For each group in the list below Jack enters the group name and clicks *Save* after each one:

Field	Value
Group	Storage
Group	Monitors
Group	Input devices
Group	Printers

¹It's planned to directly support this use-case in some version higher than 1.3

After creating these part groups, the “Group” drop down appears on the parts entry screen, allowing him to assign each of his parts to one of these groups.

Since he doesn’t expect to be running more than one or two types of CPUs, he decides not to create a separate group for those and leaves these two parts unassigned.

7.4 Defining vendors

Jack selects “ABC Parts” to purchase the inventory he needs to run his company. In order to start buying inventory, ABC Parts needs to be entered as a Vendor to LedgerSMB.

Using the work flow detailed in Section 33.2 on page 163 Jack starts to do so by going through the menu `Contacts → Add Contact → Company`. He fills out the Company creation form by clicking the `Generate control code` button and adding the data as shown in Figure 7.2 on page 64.

The screenshot shows the LedgerSMB 1.3.19 web interface. The browser address bar shows the URL: `example.com/smb-1.3/login.pl?action=login&company=example_inc`. The page title is "LedgerSMB 1.3.19 -- ehuelm". The sidebar on the left is titled "Logged into example_inc" and lists various menu items. The main content area is titled "Company" and contains the "Add Vendor" form. The form has the following fields and values:

Add Vendor	
Control Code	A-00005
Class	Vendor
Name	ABC Parts
Country	United States
Tax Number/SSN	
SIC	

Buttons: "Generate Control Code", "Retrieve", "Save".

Figure 7.2: Company entry screen

After saving the company data, Jack is presented the account data screen which he fills out as shown in Figure 7.3 on page 65.

When he’s done filling out and saving the form, he notices the empty “Discount” drop down. Reading more about account configuration check marks for AR and AP as described in Section 18.3.3 on page 106 and going back to the checks on his chart of accounts (Section 6.4 on page 58), he finds he’s missing the purchase and sales discount accounts. He adds two accounts as follows:

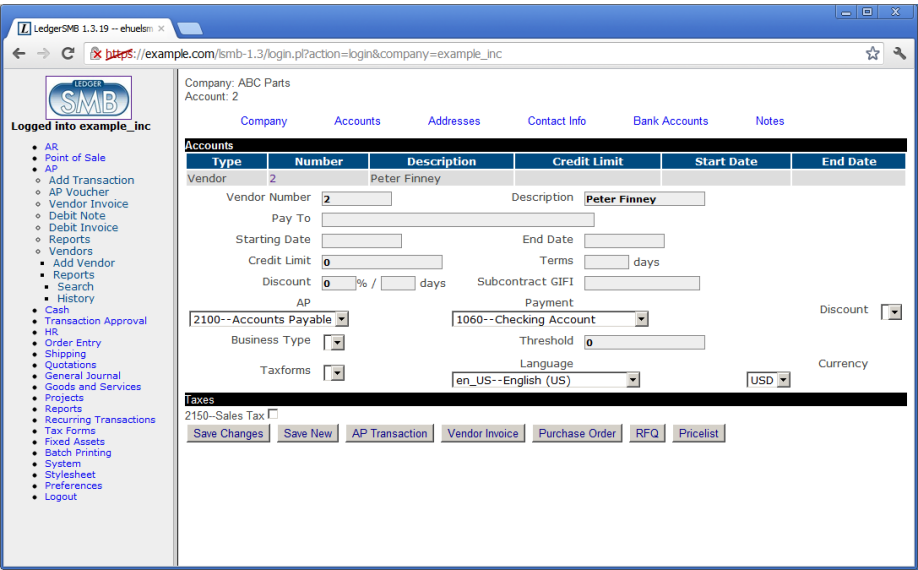


Figure 7.3: Vendor account screen

4020 Sales discount

5020 Purchase discount

After which the page looks like Figure 7.4 on page 66.

Note the top-left corner stating “Company: ABC Parts” and “Account: 2”. The information entered on the “Addresses”, “Contact Info” and “Bank Accounts” tabs will be attached to the account listed, i.e. account number 2 in this case.

The reader is referred to Section 33.2 on page 163 for a more in-depth description of the vendor data screens.

7.5 Requesting quotations

After Jack finishes setting up the parts and vendor information, he decides to use LedgerSMB to draw up a list of items he wants to order from this company. To do so he follows the menu path *Quotations* → *RFQ* which opens up a screen (shown in Figure 34.1 on page 167) for entering a new RFQ .

Remark Note that the RFQ entry screen contains prices; this is misleading at least: the printed output to be sent to the vendor does not. The fact that this screen allows entry of prices could be considered a bug.

After filling out the form in accordance with the description in Section 34.1 on page 167, Jack expedites his RFQ to his vendor through e-mail by clicking the “E-mail” button. He finds himself in the screen shown in Figure 7.6 on page 68.

The screenshot shows the LedgerSMB 1.3.19 web interface. The browser address bar displays https://example.com/smb-1.3/login.pl?action=login&company=example_inc. The sidebar menu on the left includes options like Reports, Vendors, Add Vendor, Reports, Search, History, Cash, Transaction Approval, HR, Order Entry, Shipping, Quotations, General Journal, Goods and Services, Projects, Reports, Recurring Transactions, Tax Forms, Fixed Assets, Batch Printing, System, Audit Control, Taxes, Defaults, Yearend, Admin Users, Chart of Accounts, Add Accounts, List Accounts, Add GIF, List GIF, Warehouses, Departments, Type of Business, Language, SIC, HTML Templates, LaTeX Templates, Text Templates, Stylesheet, Preferences, and Logout. The main form area is titled 'Company: ABC Parts' and 'Account: 2'. It contains a table with columns: Type, Number, Description, Credit Limit, Start Date, and End Date. Below the table, there are input fields for Vendor Number (2), Description (Peter Finney), Pay To, Starting Date, End Date, Credit Limit (0), Terms (days), Discount (0 % / days), Subcontract GIF, AP (2100--Accounts Payable), Payment (1060--Checking Account), Discount (5020--Purchases discount), Business Type, Threshold (0), Taxforms, Language (en_US--English (US)), and Currency (USD). At the bottom, there are buttons for Save Changes, Save New, AP Transaction, Vendor Invoice, Purchase Order, RFQ, and Pricelist.

Figure 7.4: Vendor account screen - with purchase discount account

The From field of the e-mail to be sent out will be filled using the “Default From” setting documented in Section 18.4.3 on page 111. The other address fields can be entered by the user and may be readily populated if the customer account has the right contact info items attached: if there are Email, Cc and/or Bcc contact items set up, those will be used to fill these fields.

At the bottom there are three selection lists. The first allows selection of the format used to send the RFQ. Available options are HTML, CSV, Postscript (PS) and PDF. The last two require Postscript and PDF support to be correctly set up. The last selection list selects the language to be used for the RFQ. If no value is selected the system default language is used.

For more detail, the reader is referred to Section 34.2.2 on page 169.

7.6 Following up on a quotation

Jack’s vendor (ABC Parts) sends him a quotation in response to his RFQ. Jack and his vendor can go back and forth a few times until Jack likes the offer he’s getting, but for the sake of argument let’s assume this is the final quotation.

Since Jack likes the offer, he wants to place an order with his vendor. To do so he looks up the RFQ he sent to the vendor using the menu path *Quotations* → *Reports* → *Search*. The screen shows additional buttons now that it shows a saved RFQ.

Jack clicks the “Purchase Order” button which creates a new order from the data in the RFQ. He completes it by entering the prices his vendor has quoted and by modifying it to be in accordance with the quotation. See Section 35.2

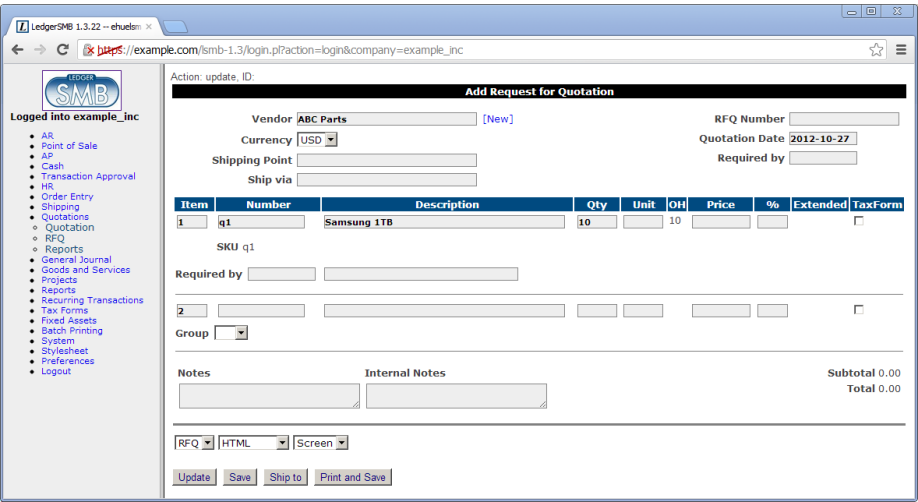


Figure 7.5: RFQ entry screen

on page 171 for more detail on the order entry screen. When finished he saves the order and mails it to ABC Parts just like he mailed the RFQ in the previous section.

Figure 36.1 on page 174 shows the screen of a saved purchase order.

7.7 Receiving ordered items

Having ordered his inventory, the vendor starts shipping. There’s too much to ship at once so the vendor ships the goods in batches: every week he ships what’s available at the end of that week - he needed to order some of the products with the manufacturer.

LedgerSMB helps Jack keep track to see if he has received everything he has ordered and that he’s not receiving too much. Jack goes through the menus Shipping → Receive. In the search screen, he fills the vendor name (ABC Parts) and clicks “Continue” to be listed all open orders from ABC Parts. By clicking on the order number, the “Receive Merchandise” screen opens as presented in Figure 7.8 on page 69. This allows Jack to handle the incoming shipment. LedgerSMB will automatically update inventory based on the amounts entered as received ².

²To resolve problems in the inventory tracking parts of LedgerSMB (inherited from before the fork), a significant change has been implemented in 1.3.31: inventory changes won’t be recorded until invoices have been posted.

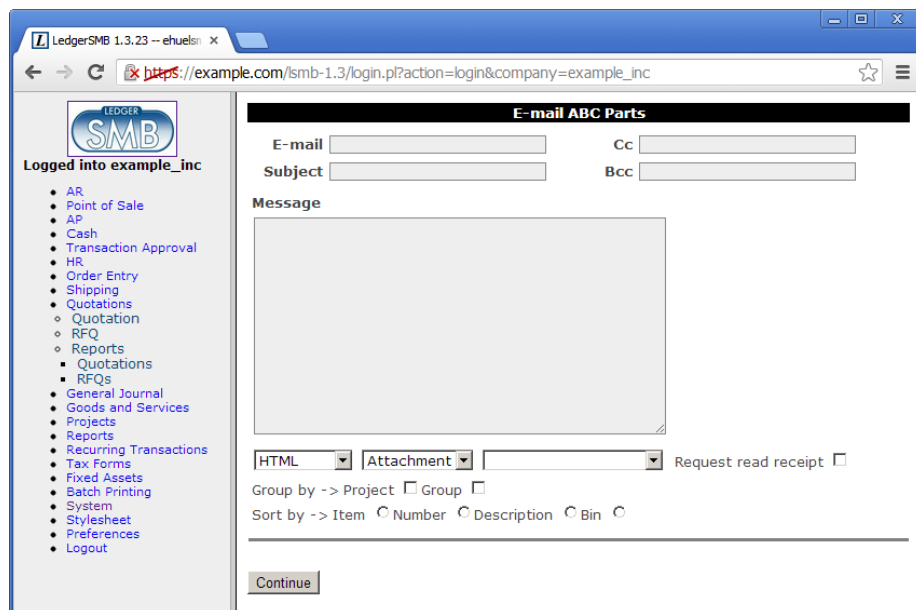


Figure 7.6: RFQ e-mail screen

7.8 Receiving an invoice

7.9 Paying an invoice

LedgerSMB 1.3.22 -- ehuelm

https://hix.nu/smb-1.3/login.pl?action=login&company=example_inc

Logged into example_inc

- AR
- Point of Sale
- AP
- Cash
- Transaction Approval
- HR
- Order Entry
- Shipping
- Quotations
 - Quotation
 - RFQ
 - Reports
 - Quotations
 - RFQs
- General Journal
- Goods and Services
- Projects
- Reports
- Recurring Transactions
- Tax Forms
- Fixed Assets
- Batch Printing
- System
- Stylesheet
- Preferences
- Logout

Action: edit, ID: 8

Edit Request for Quotation

Vendor **ABC Parts** [New] Open Closed

Currency **USD** RFQ Number **3**

Shipping Point Quotation Date **2012-10-27**

Ship via Required by

Item	Number	Description	Qty	Unit	OH	Price	%	Extended	TaxForm
1	q1	Samsung 1TB	10		9				<input type="checkbox"/>
SKU q1									
Required by <input type="text"/>									
2	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="checkbox"/>
Group <input type="text"/>									
Notes <input type="text"/> Internal Notes <input type="text"/>									Subtotal 0.00
									Total 0.00

RFQ HTML Screen

Update Print Save Ship to E-mail Print and Save Save as new Print and Save as new Vendor Invoice Purchase Order Delete

Attached and Linked Files

File name	File type	Attached at	Attached by
File name	File type	Attached to type	Attached to
File name	File type	Attached at	Attached by

[Attach]

Figure 7.7: RFQ entry screen

LedgerSMB 1.3.23 -- ehuelm

view-source:https://example.com/smb-1.3/login.pl?action=login&company=example_inc

https://example.com/smb-1.3/login.pl?action=login&company=example_inc

Logged into example_inc

- AR
- Point of Sale
- AP
- Cash
- Transaction Approval
- HR
- Order Entry
- Shipping
- Ship
- Receive
- Transfer
- Quotations
- General Journal
- Goods and Services
- Projects
- Reports
- Recurring Transactions
- Tax Forms
- Fixed Assets
- Batch Printing
- System
- Stylesheet
- Preferences
- Logout

Receive Merchandise

Vendor **ABC Parts** Contact

Shipping Point Order Number **4**

Ship via Order Date **2012-10-27**

Warehouse PO Number

Date Received **2012-11-21**

Number	SKU	Description	Qty	Recd	Unit	Bin	Serial No.
q1	q1	Samsung 1TB	2	1			

Bin List HTML Screen

Update Print Done

Figure 7.8: Order receipt entry screen

Chapter 8

Ramping up to the first sale

8.1 Creating a customer

A customer is considered type of entity or counterparty¹. There are two types of counterparties, "company" and "person". A "company" entity is legalized by the state and typically incorporated, a sole proprietorship, or an LLC. A "person" is considered an unincorporated entity.

The first step in creating a customer is to create the counterparty, then annotate the counterparty as a "customer".²

Jack is going to setup a company as a customer and starts by navigating to add contact screen using the menu path `Contacts → Add Contact → Company`.

¹The terms "counterparty" and "entity" mean the same thing in LSMB.

²A single counterparty can also be annotated as a vendor allowing both sales to and purchasing from a single entity.

Company

Person

Add Customer

Control Code

Class

Vendor

Name

Country

United States

Tax Number/SSN

Sales Tax ID

License Number

Generate Control Code

Retrieve

Save

Figure 8.1: Add contact screen

Referencing the workflow defined at Section 33.2 on page 163 Jack creates the company using the screen shown in Figure 8.1 on page 72.

Jack does the minimum to set up the counterparty by making these changes to the screen:

Field Name	Field Value	Notes
Name	ABC, Inc.	
Class	Customer	
Country	United States	

Table 8.1: Company data

When Jack is done entering the data he clicks the `Generate Control Code`, then clicks the `Save` button, which brings up the screen shown in Figure 8.2 on page 73.

Company

Credit Accounts

Addresses

Contact Info

Bank Accounts

Notes

Files

Accounts

Type	Number	Description	Credit Limit	Start Date	End Date
Class	Customer	Number		Description	
Pay To					
Starting Date		End Date		yyyy-mm-dd	
Threshold		Credit Limit			
Payment Terms		Discount	% / days	Account	
AR	1200--Accounts Receivables	Payment	1060--Checking Account	Currency	USD
		Language	English		

Taxes

2150--Sales Tax

Tax Included

Save New

Figure 8.2: Credit account screen

This brings up the “Credit Accounts” screen Figure 8.2 on page 73 where Jack can make this company counterparty a customer.

Jack does the minimum to set up the customer by making these changes to the screen:

Field Name	Field Value	Notes
Number	1	There can be multiple credit accounts associated with this counterparty. This is the first of those accounts. The number must be unique to the counterparty.
'Pay To	ABC, Inc.	

Table 8.2: Credit Accounts data

When complete jack clicks the Save New button.

Company

Credit Accounts

Addresses

Contact Info

Bank Accounts

Notes

Files

Accounts

Type	Number	Description	Credit Limit	Start Date	End Date
Customer 1	0				

Class

Customer

Number

1

Description

Pay To

ABC, Inc.

Starting Date

yyyy-mm-dd

End Date

yyyy-mm-dd

Threshold

0

Credit Limit

0

Payment Terms

days

Discount

0

%

days

Account

AR

1200--Accounts Receivables

Payment

1060--Checking Account

Currency

USD

Language

English

Taxes

☐ 2150--Sales Tax

☐ Tax Included

Save Changes

Save New

AR Transaction

Customer Invoice

Sales Order

Quotation

Pricelist

Profit and Loss

Period selection

Select using

☒ Dates

☐ Periods

From

yyyy-mm-dd

To

yyyy-mm-dd

Report options

Account numbers

☒

Hierarchy type

☐ Full

☒ Account category

Not set up for hierarchy reporting, please see linked instructions

Continue

Figure 8.3: Credit account 2nd screen

Now that the customer credit account is setup, Jack wants to add the customers address. He clicks the `Addresses` tab at the top of the screen and sees the screen shown in Figure 8.4 on page 74.

Company

Credit Accounts

Addresses

Contact Info

Bank Accounts

Notes

Files

Locations

This Account	Type	Address	City	State/Province	Zip/Post Code	Country
--------------	------	---------	------	----------------	---------------	---------

Attach To

Entity

Type

Billing

Address

City

State/Province

Zip/Post Code

Country

United States

Save New Location

Figure 8.4: Addresses screen

Jack has to decide where to attach his customer’s address. An address on the “entity”, which is also called a counterparty, is an address that applies to all accounts associated with that entity. An address on a “credit account” applies to that specific customer/vendor instance. One entity may have multiple customers, multiple locations, multiple departments, etc., each with their own address details

Jack enters the address by making these changes to the screen:

Field Name	Field Value	Notes
Attached To	Entity	This company has only 1 address
Type	Billing	
Address	123 Main St	In the first address field
City	Augusta	
State/Province	Mariana Islands	
Zip/Post Code	00000	

Table 8.3: First company address data

When Jack is done entering the data he clicks the `Save New Location` button.

8.2 Sending out a quote

8.3 Sending out a sales order

Chapter 9

Shipping sales

Chapter 10

Invoicing

10.1 Handling sales taxes

10.1.1 Invoices with taxes included

10.1.2 Invoices with explicit tax amounts

10.2 Invoice Editing

Posted invoices only have 2 fields that can be edited:

1. Internal notes field
2. Sales person - The Sales Person drop-down is only shown if there are sales people. Sales People are created through Employees and checking the Sales check-mark.

After editing, click the `Save Info` button to save the changes.

Chapter 11

Collecting sales invoice payments

11.1 Customer payments

11.2 Customer payment mismatch

11.2.1 Choosing between pardoning and registering underpayment

11.2.2 Large ones, as in partial payments or largish under/over payments

11.2.3 Pardoning small mismatches

Chapter 12

Paying vendor invoices

12.1 Handling vendors who match amounts to exact invoices

12.2 Handling vendors with running balances

12.3 Handling bounced checks

12.3.1 Voiding checks to undo payments of vendor invoices relating to bounced checks

Chapter 13

Monitoring arrears

13.1 Handling interest on arrears

Chapter 14

Branching out: services

14.1 Creation / assignment to different accounts

14.2 Recording service hours

14.3 Customer approval on service hours

14.4 Invoicing services

Chapter 15

Branching out II: service subscriptions

Part III

Configuration

Chapter 16

Overview

16.1 Introduction

This section of the book describes how to set up LedgerSMB and its components. Configuration is assumed to be mostly one-off and rather technical in nature. To find out which tasks might need to be performed in order to keep the application in good health the reader is referred to the 'Administration Introduction', Section 19.1 on page 121.

Chapter 17

Global configuration

17.1 Apache

Section about installing on Apache 2+
items to be discussed:

Forwarding of authentication
@@@TODO

PSGI configuration
@@@TODO

performance
cgiD configuration: don't (yet) [but will be supported once all legacy
code is gone] @@@TODO

security
suEXEC environment @@@TODO

17.1.1 Differences between Apache 1.3 and 2+

Explain how to use lsmb with 1.3 instead of 2+.

17.2 PostgreSQL

pg_hba.conf
authentication @@@TODO

security
local vs IP connections @@@TODO

17.3 LedgerSMB version numbers

LedgerSMB version numbers are in the form of Major.Minor.Patch-Optional Tag. For example, if the production release is 1.9.27, then the 1.9 development release is 1.9.28-dev.

Major

An increment in the major release number can mean significant architectural, Application Programmer Interface (API), functional, or usage changes. It is expected that an upgrade to a new Major version is going to be planned and tested by the user organization before upgrading.

Minor

An increment in the minor release number may indicate changes to APIs, interfaces, user instructions, etc. But these changes are not expected to have major impact and should require minor planning and testing. Often small impact enhancements are back-patched to previous Minor versions as patches.

Patch

Increments in the Patch number represent bug fixes, security improvements, or enhancements that do not break existing functionality, usage, or APIs. These changes are expected to be applied to an installation as soon as possible.

Optional Tag

Common values include dev, beta, or alpha. Typically, these are only used internally by the LedgerSMB developers.

17.4 LedgerSMB Configuration

LedgerSMB configuration using `ledgersmb.conf` is deprecated as of 1 Jan 2023. New functionality may only be available when using `ledgersmb.yaml` configuration file.

For the time being there is a conversion step that converts the old 'ledgersmb.conf' to 'ledgersmb.yaml', but the old conf file does not support new functionality.

17.4.1 ledgersmb.yaml

For an example of the default, non debug `ledgersmb.yaml` see <https://github.com/ledgersmb/LedgerSMB/blob/master/doc/conf/ledgersmb.yaml>

cookie

@@@TODO

db

@@@TODO

default_locale

@@@TODO

environment_variables

@@@TODO

extra_middleware

@@@TODO

logging

@@@TODO

login_settings

@@@TODO

mail

Email can be configured by selecting which of the three available transports to use. The default `ledgersmb.yaml` file contains examples for the first two.

`Email::Sender::Transport::Sendmail` – Emails are sent using the local server's `sendmail` binary. The configuration parameters are:

```
transport:$class - Email::Sender::Transport::Sendmail
transport:path - optionally provide a path to the directory that
contains the 'sendmail' binary.
```

`LedgerSMB::Mailer::TransportSMTP` - Emails are sent using a remote SMTP server. The configuration parameters are:

```
transport:$class - LedgerSMB::Mailer::TransportSMTP
transport:host - The required host name of the smtp server.
transport:port - The required port number of the smtp server.
Note this might vary depending on whether TLS or SSL is used.
```

`sasl_username:$class` – The required smtp server authentication method. The values can be ‘Authen::SASL’ or ‘Authen::SASL::SCRAM’.

`sasl_username:mechanism` – The available mechanism are defined at <https://metacpan.org/dist/Authen-SASL> or <https://metacpan.org/dist/Authen-SASL-SCRAM> depending on the selected ‘\$class’.

`sasl_username:callback:user` – The required SMTP user name. ‘the-user’ in the default file is a place holder and must be replaced.

`sasl_username:callback:pass` – The required SMTP password. ‘SECURITY-FIRST’ in the default file is a place holder and must be replaced.

`Email::Sender::Transport::DevNull` - Emails are sent to /dev/null, in other words emails are not sent anyplace. This prevents errors in the user interface, but throws away any mail. There is only one configuration parameter. This is not a recommended production configuration. It is usually used for testing.

`transport:$class` – `Email::Sender::Transport::DevNull`

miscellaneous

@@@TODO

output_formatter

@@@TODO I really don’t have a good way to format lists explanations. See below at `paths:config:workflows` for an example. Guidance welcome.

paths

This section configures the various paths used by LedgerSMB. The configuration parameters are:

`config:locale` – Path to locale files. Defaults to `locale/po`.

`config:sql` – Path to the SQL schema definition files.

`config:sql_data` – Path to the reference and initial SQL database load files. For example, the names of the countries.

`config:templates` – Path to the templates base directory. Typically set to `templates`.

`config:UI` – Path to the UI HTML files. Defaults to `./UI/`

`config:UI.cache` – Path to the location of the UI template cache. These are cached after they have been parsed and translated. This improves performance.

`config:workflows` – A list of the Directories where workflow files are stored. Contains the default and custom workflows. Custom workflows are used to override behavior of the default workflows by providing actions, conditions, etc. with the same name and type or by providing workflows of the same type with additional states and actions. Default workflows defaults to `workflows`. Custom workflows defaults to `custom_workflows`. Default workflow path must precede all the custom workflow paths. @@@TODO is the last statement correct? Can there be more than 2 paths?

printers

This section contains a list of printers and their definition.

The default `ledgersmb.yaml` file shows two printers named 'Laser' and 'Epson' with the printers defined using the linux `lpr` command and its arguments.

This default definition will provide for the selection of the printers named 'Laser' and 'Epson' in the LedgerSMB user interface.

For more information search the internet for 'linux lpr command' or use `man lpr` at the linux command line.

reconciliation_importer

@@@TODO

setup.settings

@@@TODO

ui

@@@TODO

workflows

@@@TODO

Chapter 18

Per company configuration

18.1 Matching your business processes

By default, LedgerSMB operates such that all optional functionality is available and the user decides to use it or not based on which menu items they select, what fields they enter data into, and what buttons they click.

Removing application roles (see Appendix E starting at page 243) can limit the visibility of menu items, data fields, and buttons. This will simplify the users view of the system, reduce training, and better configure LedgerSMB to your business requirements.

Outside of application roles, the only other enforced business process configuration is whether the same person can both create and post transactions. It is called 'separation of duties' and is defined in Section 18.4.3 on page 111.

LedgerSMB is configured to adjust inventory when a Sales or Purchase Invoice is posted. This closely matches retail business processes where the customer walks out of the establishment with the product and an invoice (or receipt). This functionality can also be used for wholesale shipping applications because LedgerSMB can also produce picking and shipping documents, just remember that the inventory transaction happens when an invoice is posted.

LedgerSMB uses FIFO for COGS and inventory calculations. There are provisions for alternatives, but the code is not yet complete. See Section 3.3 on page 36 for a detailed explanation of FIFO calculations.

In addition to the above, LedgerSMB has configurable Workflows . These are not user configurable but your technical support staff should be able to create and edit them. See Chapter VIII starting at page 223.

Contact the [development team](#) for other business process customizations. In most cases the need for more flexible matching of LedgerSMB to your business processes is understood, but the project has not yet had any customer requests or development volunteers.

18.2 Administrative user

@@@ TODO Need to add content explaining the administrative user.

18.3 Chart of Accounts

The Chart of Accounts or CoA defines how financial reports are organized and summarized. This section describes the various configuration options available when creating or editing the CoA.

18.3.1 Predefined Chart of Accounts

LedgerSMB provides predefined Chart of Accounts that can be used out of the box for many businesses. Most new LedgerSMB setups start with one of the predefined Charts of Accounts and add or delete as necessary to customize it for their business.

There is also an option to import a Chart of Accounts. Importing is described in Section 18.3.5 on page 109.

The predefined CoA files are Extensible Markup Language (XML) format files.

LedgerSMB provides an XML Schema Definition (XSD) file, which might help in developing a custom CoA XML file, located at <https://github.com/ledgersmb/LedgerSMB/blob/master/doc/company-setup/configuration.xsd>.

To use a custom CoA XML file, it will need to be placed in the correct directory prior to running `setup.pl`. The correct directory will be one of the locale sub-directories in `locale/coa`.

The predefined Chart of Accounts are organized by country and localized. For the United States the following predefined Chart of Accounts are available:

- General.xml
- GeneralHierarchical.xml
- Manufacturing.xml
- Service.xml
- UCOA-Form990.xml
- UCOA-Form990EZ.xml

Similar predefined Charts of Accounts are available for other countries and languages.

See Section 5.1.3 on page 45 for instructions on using these predefined accounts.

The following examples use the `GeneralHierarchical.xml` account structure. This file can be found at <https://github.com/ledgersmb/LedgerSMB/blob/master/locale/coa/us/GeneralHierarchical.xml>.

18.3.2 Account structure

The system allows ordering accounts into groups by assigning accounts to headers. Headers can themselves be assigned to other headers resulting in hierarchies of account groups.¹

There are multiple reasons for wanting to use hierarchies. One of those reasons is that expense accounts in prior versions were listed as one long list under Expenses while income accounts are listed as a -usually shorter- list under Income. Personnel expenses are usually spread across multiple expense accounts. With lots of other expense accounts also listed, what’s the total expense on personnel?

Another use-case for using hierarchies might be because you’re running a “margin business”. That is, you’re only buying what you’re selling and the cost of goods sold is the largest part of your expenses. In cases like this it can be a good idea to use a different setup of the income statement: one where cost of goods sold is immediately subtracted from income, leaving gross margin to cover all other expenses in the company.

In order to set a heading’s parent, go to the General Journal → Chart of Accounts. Click on the account number. If the account is a heading account that has a parent heading, the resulting screen shown in Figure 18.1 on page 103.

Heading		Translations	
Account Number	<input type="text" value="2050"/>		
Description	<input type="text" value="CURRENT LIABILITIES"/>		
Heading	<input type="text" value="2000--ALL LIABILITIES"/>		
<div>Save Save as new</div>			

Figure 18.1: Configure Account Hierarchy

If the account is a not a heading account, but has a parent heading, then the result is shown in Figure 18.2 on page 104.

¹Although the database structure supports this type of account hierarchy from 1.3, it was not fully in use in reports until 1.4.17. In 1.3 accounts can be assigned a header, but headers can’t be assigned to headers themselves.

Account Translations

Account Number 2100

Description Accounts Payable

Account Type Liability

Heading 2050-CURRENT LIABILITIES

Negative balance heading

Configuration

Summary account for AP

Options Contra Recon Tax Obsolete

Include in drop-down menus

Receivables	Income	Payment	Tax	Overpayment	Discount
Payables	Expense/Asset	Payment	Tax	Overpayment	Discount
Tracking Items	Income	COGS	Tax	Returns	
Non-tracking Items	Income	Expense	Tax		
Fixed Assets	Fixed Asset	Depreciation	Expense	Gain	Loss

Save Save as new

Figure 18.2: Account Setup

If the "Current Earnings" account has been set in *System* → *Defaults*, see Figure 18.4 on page 108, it is possible to select either the full or non hierarchical (labeled "Account category") account layouts when generating the "Balance Sheet" or "Income Statement" reports.

For example, *Reports* → *Income Statement* as shown in Figure 18.3 on page 104.

Report options

Account numbers ☒

Hierarchy type ☒ Full ☐ Account category

Language English

Continue

Figure 18.3: Report Using Hierarchy

18.3.3 Account setup

Headers don't have any configuration, other than their number and description.

Accounts also have a number and description, but require additional configuration for the application to work correctly.

The settings, which are shown in Figure 18.2 on page 104 are described in the following paragraphs.

The main setup consists of the following:

Account Number

Income statements and balance sheets reports are ordered by account number. Traditionally, account numbers are 4 digits with accounts being grouped by the first digit, but this type of grouping is not enforced by LedgerSMB. Grouping is handled using headings as explained in Section 18.3.2 on page 103.

Description

Should be a relative short, easy to understand description of what the account is used for.

Account Type

Asset, Liability, Equity, Equity temporary, Income or Expense.

Heading

Optional entry. Used if this account is a child of a heading account.

Negative balance heading

Balance sheet account balances should - generally - not be reported as negative amounts²: a negative asset is in fact a liability. This functionality reports the given account under the primary header as long as the asset/liability is positive and reports it under the "negative balance heading" as soon as the asset/liability turns negative (the expectation is that the alternative header is a liability/asset header instead of an asset/liability header).

Account configuration

The items in the configuration box as shown in Figure 18.2 on page 104 are used to configure the account for use in LedgerSMB.

There are currently three types of optional summary accounts:

AR Marking an account as a summary account for AR means that all outstanding receivable amounts will be posted to this account. The Accounts Receivable administration will contain the details of which amount is owed by which customer.

AP Same as the AR account, except for amounts owed to vendors.

Inventory

This account holds the monetary value equal to the items on stock.

Each account may have zero, one or more of the following options selected.

²Notable exception here are "cumulative depreciation" accounts in fixed asset accounting, but these are usually marked as "Contra" – causing them to be reported as positive numbers..

Contra

This checkmark identifies the account as a contra account, which means that the account is going to hold the opposite of an account it's associated with. A good example of this kind would be the depreciation account associated with a fixed asset account where the depreciation account contains the credit amount to be added to the original asset (debit) value to get the current asset value.

Recon

This checkmark identifies the account as one which needs reconciliation as described in Section 43.3 on page 198.

Tax This checkmark identifies the account as a Tax (VAT/Sales) account. Tax accounts need

to be further configured. See Chapter 26 starting at page 143 for further discussion of the subject.

Obsolete

This checkmark identifies the account as not being usable going forward. The account cannot be deleted because it may contain data.

Include in drop-down menus

In order to enhance the user interface, non-summary accounts may be added to drop down menus throughout LedgerSMB. Adding an account is done by checking the box. Each row in the UI is explained below.

Receivables checkmarks**Income (AR_amount)**

This check mark adds the account to the list of accounts in the transaction screens which are used to post income on.

Payment (AR_paid)

This check mark adds the account to the list of accounts to choose from in the Receipts (AR) and Payments (AP) screens as well as the payments lines on invoices and transactions. Additionally, it

adds the account to the part entry screen as described in Section 25.1.1 on page 137.

Tax (AR_tax)

This check mark makes the account show up as a check mark on the customer (AR) or vendor (AP) entry screen. See Chapter 26 starting at page 143 for further discussion.

Overpayment (AR_overpayment)

Adds the account to the receipts screen as discussed in Section 42.5 on page 194.

Discount (AR_discount)

Adds the account to the customer entry screen's selection list for accounts to post payment term discounts on.

Payables checkmarks

The payables UI works the same way as the receivables described in the previous list. The difference is that the technical names of the configuration identifiers are prefixed by AP_ instead of AR_.

Tracking Items

The items on this line relate to stocked items, i.e. those tracked for inventory: parts and assemblies.

Income (IC_sale)

Adds the account to the selection list of income accounts on the part and assembly definition screens.

COGS (IC_cogs)

Adds the account to the selection list of COGS @@@ accounts on the part, assembly and overhead definition screen.

Tax (IC_taxpart)

Adds a check mark to the part and assembly definition screen for the applicable account. See Chapter 26 starting at page 143 for more details on how taxes work in LedgerSMB.

Returns (@@@ Need help here)

@@@

@@@ TODO Labor/Overhead, when part of an assembly, are capitalized in inventory and accounted for in COGS when the resulting assembly is sold. We should add an explanation to that extent somewhere in the book and refer to it from here.

@@@ TODO Labor sold isn't "inventory tracked", so it is a service. Labor/Overhead used to manufacture assemblies is "inventory tracked" and capitalized. We should explain somewhere that Labor sold immediately is a service instead.

Non-tracking items

The items on this line relate to untracked (non stocked) items, i.e. services.

Income (IC_income)

Adds the account to the income account selection list in the service definition screen.

Expense (IC_expense)

Adds the account to the expense account selection list in the service definition screen.

Tax (IC_taxservice)

Adds a check mark to the service definition screen for the applicable account. See Chapter 26 starting at page 143 for more details on how taxes work in LedgerSMB.

Fixed assets**Fixed asset (Fixed_Asset)**

Marks the account as holding the original asset value for the fixed assets module, for some classes of fixed assets.

Depreciation (Asset_Dep)

Marks the account as holding the cumulative depreciation amount for the fixed assets module, for some classes of fixed assets.

Expense (asset_expense)

Adds the expense account to the selection list of the fixed assets accounting module. See Section 43.6 on page 200 for more details.

Gain (asset_gain)

Account to hold book value gain upon disposal of a fixed asset.

Loss (asset_loss)

Account to hold book value loss upon disposal of a fixed asset.

18.3.4 Special accounts

Special accounts are set by going to `System` → `Defaults` and scrolling down to "Default Accounts".

As you can see, in Figure 18.4 on page 108 the heading "3999 -- NET MARGIN" has been selected and is the heading which is used as the highest level for the P&L and lowest level at which income and expenses are being reported in the balance sheet.

Default Accounts	
Current earnings	3999 -- NET MARGIN ▾
Inventory	1510 -- Inventory ▾
Income	4010 -- Sales ▾
Cost of Goods Sold	5010 -- Purchases ▾
Foreign Exchange Gain	4450 -- Foreign Exchange Gain ▾
Foreign Exchange Loss	5810 -- Foreign Exchange Loss ▾

Figure 18.4: System Default Accounts

The other special accounts are used as follows:

- Current earnings - Used to summarize the P&L result as a single line on the Balance Sheet,
- Inventory - Used to summarize the inventory value on the balance sheet.
- Income - Used to summarize income on the Income Statement.
- Cost of Goods Sold - Used to summarize the cost of goods on the Income Statement.
- Foreign Exchange Gain - Accounts for the gain in value differences in foreign currencies when recording payments to invoices in foreign currencies. In case an invoice is issued at 1 EUR == 1 USD, but payments arrive when 1 EUR == 0.80 USD, the amount of USD paid is still the invoiced amount, but the EUR amount differs. The EUR difference ends up in the Foreign Exchange Gain or Foreign Exchange Loss accounts. See Section 42.8 on page 196 for more information.
- Foreign Exchange Loss - Accounts for the loss in value differences in foreign currencies when recording payments to invoices in foreign currencies. See Section 42.8 on page 196 for more information.

18.3.5 Importing chart of accounts

A custom Chart of Accounts can be imported in CSV format by going to **General Journal** → **Import Chart** and selecting the import file.

The import screen list the required fields. Field content definitions are explained above.

18.4 System menu settings

This section enumerates the “System” menu’s immediate children. In some cases the functionality is too complex and is referred to a chapter of its own.

18.4.1 Audit control

Enforce transaction reversal for all dates

This is a Yes/No value which affects the actions which can be performed on posted financial transactions.

- No means transactions can be altered or deleted, even after posting them. Note that if a transaction has been posted before the latest closing date, it can never be altered, not even when this value is in effect.

- Yes means transactions can't be altered after posting. This setting is highly preferred and considered the only correct approach to accounting as it assures visible audit trails and thereby supports fraud detection.

Close books up to

@@@ This item isn't a system setting; shouldn't it move to "Transaction approval"?? That way system settings (config) and processes are separated.

@@@ My preference is to remove the setting entirely and rely on year-end workflow. We might add an account checkpoint interface as well at some point –Chris T

It's advisable to regularly close the books after review. This prevents user error changing reviewed numbers: after closing the books, it's no longer possible to post in the closed period.

There are also performance benefits to closing the books, because LedgerSMB uses the fact that the figures are known-stable as a performance optimization when calculating account balances.

Activate audit trail

This is a Yes/No value which - when Yes - causes the system to install triggers to register user actions (creation/adjustments/reversals/etc...) executed on financial transactions.

@@@ Once activated, where can we see it the audit trail??

@@@ This setting should go. In 1.3 the audit trails are always enforced via triggers so this setting does nothing. –CT

18.4.2 Taxes

This page lists all accounts which have the "Tax" account option enabled as discussed in Section 18.3.3 on page 104.

Each account is listed at least once, but can be listed many times, if it has had different settings applied over different time periods. E.g. if one of the current VAT rates is 19%, today but it used to be 17.5% until last month, there will be 2 rows for the applicable VAT account. See Chapter 26 starting at page 143 for further discussion of how taxes work in LedgerSMB and the choices involved when being required to handle changes in tax rates.

Each row lists the following fields:

Rate (%)

The tax rate to be applied when calculating VAT to be posted on this account.

Number

Account number

Valid To

The ending date of the settings in this row. This can apply to the rate as well as the ordering or the tax rules (but usually applies to the rate).

Ordering

This has to do with cumulative taxes. For example if two taxes exist and one has an ordering of 0 and one of 1, then the second tax will be calculated on a basis that includes the first. One place where this used to be used was in Quebec, where GST was taxable under PST.

Tax rules

LedgerSMB features a flexible structure to facilitate complex tax calculations (see Section 26.4 on page 145). By default the “Simple” module is the only one installed.

18.4.3 Defaults

Business number

This is used to store an arbitrary identification number for the business. It could be used to store a business license number or anything similar.

Weight unit

The unit of measurement for weights. @@@ why don't we have a unit of measurement for distance as well??? And maybe a unit of measurement for content?

Separation of duties

Separation of duties is a method to help reduce fraud where one employee can't modify the accounting ledger without another employee's approval.

Select “Yes” if you want to activate separation of duties or “No” if you don't want to activate it.

In order for separation of duties to be enforced, user roles have to be set differently for each user. This is done by removing the `draft_post` role from the users that cannot post and making sure that the users that can post have the role enabled. See Section 24.3 on page 132 for more details about changing and setting User Roles.

Default accounts

This setting will be used to preselect an account in the listings of the three categories listed below:

- Inventory
- Income
- Expense

Foreign exchange gain and loss accounts

When working with foreign currencies, the system needs two special purpose accounts. One to post the gains onto which are caused by foreign currencies increasing in value; the other to post the losses onto which are caused by foreign currencies decreasing in value.

Default country

This setting indicates which country needs to be pre-selected in country selection lists.

Default language

The language to be used when no other language has been selected. Several parts of the application require language selection, such as customer, vendor and employee entry screens.

Templates directory

This setting indicates which set of templates - stored in the `templates/` directory - should be used. In a standard installation, the drop down lists two items:

demo

which contains templates based on \LaTeX , which is more commonly installed but has issues dealing with accented characters

List of currencies & default currency

Enter a list of all currencies you want to use in your company, identified by their 3-letter codes separated by a colon; i.e. "USD:EUR:CHF". To ensure correct operation of the application, at least one currency (the company default currency) must be listed. In case of multiple currencies the first is used as the company default currency.

Company data (name /address)

The fields "Company Name", "Company Address", "Company Phone" and "Company Fax" will be used on printed/e-mailed invoices.

Password duration

This is an integer value field measuring the validity period in days for passwords set through the user's *Preferences* screen. If this field is empty, passwords set through that method won't expire.

The user has to log into LedgerSMB after this field is changed and prior to the expiration of the previous setting in order for the new duration to take effect.

A user will receive password expiration reminders upon logging starting a week before password expiry. When not acted upon, starting two days before expiry an hourly popup will appear requesting the user to change the password.

The application behaves this way because users with expired passwords won't be able to log in: their password will need to be reset by a user admin.

Note that passwords set by admins for other users expire within 24 hours after setting them. This value is hard coded and can't be overruled. This is a security measure taken to make sure as few unused accounts as possible exist: Existence of such accounts could open up security holes.

Default E-mail addresses

These addresses will be used to send e-mails from the system. Note that the "Default Email From" address should be configured in order to make sure e-mail doesn't look like it's coming from your webserver. The format to be used is `'Name' <e-mail address>` where the e-mail address should be inserted between the `<` and `>`.

Max per dropdown

Some elements in the screens may present a drop down. However, drop downs are relatively unwieldy to work with when used to present a large number of values to choose from.

This configuration option sets an upper limit on the number of records to be presented as drop down. When the number is exceeded, no drop down is used. Instead, a multi-step selection procedure will be used.

Item numbering

Many items in the system have sequence numbers: invoices, parts, etc. These can be just a number (i.e. 1 or 37) or they can also be both prefixed and suffixed. For example, INV0001 for invoices and EMP001 for employees or YOU-0001TOO, in which case the next item will be YOU-0002TOO.

You can only issue every number in the sequence once, but you can issue Y21-001 and Y22-001 by changing the sequence number format at the beginning of the year.

The numbers shown in the input boxes will be used to generate the next number in the numbering sequence.

GL Reference number

The default reference number for the next GL transaction.

Sales invoice/ AR Transaction number

This number is used to generate an invoice number when none is being filled out by the user.

Sales order number

Same as Sales invoice number, except that it's used for sales orders @@@ layout issue: the label is too big to fit on the page

Vendor invoice/ AP Transaction number

Same as Sales invoice, except that the number is used for accounts payable transactions. @@@ layout issue: the label is too big to fit on the page

Sales quotation number

Same as sales order number, except that it's used for quotations.

RFQ number

Request for quotation number is like the sales quotation number, except that it is used to track which vendors have been asked for quotes.

Part number

All parts, services and assemblies are identified by a unique number. When an item is created and no number is entered by the user, a number is generated from this sequence.

Job/project number

Used when creating new projects.

Employee number

Same as the sales invoice number, used by new employee entry.

Customer number

@@@ is this the control code number? or is this meta_number?? – Meta-number (CT)

Vendor number

@@@ same question as customer number

Check prefix

The prefix to use when printing checks. There's no check sequence number. That sequence number is requested from the check printing interface, because checks can be created outside the application as well, meaning the numbers can get out of sync.

18.4.4 Year end

@@@ Rename “Yearend” in menu interface to “Year end”.

@@@ IMO this section doesn’t belong here, because it’s a process, not config, but does it belong in this menu then? IMO it doesn’t...

18.4.5 Admin users

@@@ Same as Year end; doesn’t belong here...

18.4.6 Chart of accounts

@@@ Chart of accounts isn’t exactly a “process”, but it doesn’t feel like being pure config either. At any rate it’s a fact that the CoA discussion is a full chapter in and of itself - so discussion here isn’t necessary anymore.

18.4.7 Warehouses

Warehouses are stocking locations. They don’t have any properties (in the system) other than that they have a name. Warehouses can be added, modified and deleted from the `System → Warehouses` menu item.

18.4.8 Departments

Departments can be used to divide a company in smaller pieces. LedgerSMB distinguishes two types of departments:

Profit centers

which can be associated with any type of transaction, including AR transactions.

Cost centers

which can be associated with all types of transactions, except AR transactions.

Departments can be created (added), modified or deleted through the `System → Departments` menu item.

18.4.9 Type of business

Types of business are used in sales operations where customers can be assigned a type of business. Based on the type of business assignment, quotations, sales orders and invoices will automatically apply discount rates. For each type of business you enter a description and a discount rate to be applied.

18.4.10 Languages

The language table is the table users can select languages from, both to present the UI of the application as well as the setting for customers to be used to generate documents.

This listing should correspond to the actual translations of the application being available in the program installation directory.

Languages can be added, modified or deleted through the `System → Language` menu item.

18.4.11 Standard Industry Code (SIC)

SI codes feature these three fields:

Code

Heading

Description

When creating a company you can assign that it an SIC code, irrespective of its role (i.e. customer, vendor, lead or anything else). An example of an SI code system is the US's NAICS³ code. Other countries have their own coding systems such as ANZSIC⁴ for Australia and New Zealand and NACE⁵ for Europe

The SIC field currently doesn't support a specific function in the application and is there merely for informational purposes. However in the future its role could be extended to include impact on reports, taxes or other functionalities where type of industry could matter.

18.4.12 Templates

Templates are available to control the output format of many LedgerSMB outputs including Balance Sheet, Sales Orders, etc.

There are 3 types of templates: `LaTeX`, `HTML`, and `CSV`. Templates are accessed by navigating to `System → Templates`. You should see the view shown in Figure 18.5 on page 117.

The template you want to change is selected in the "Template" drop-down. The template format you want to change is selected in the "Format" drop-down.

³<https://www.census.gov/naics/>

⁴<https://www.abs.gov.au/statistics/classifications/australian-and-new-zealand-standard-industrial-classification-anzsic/latest-release>

⁵https://ec.europa.eu/competition/mergers/cases/index/nace_all.html

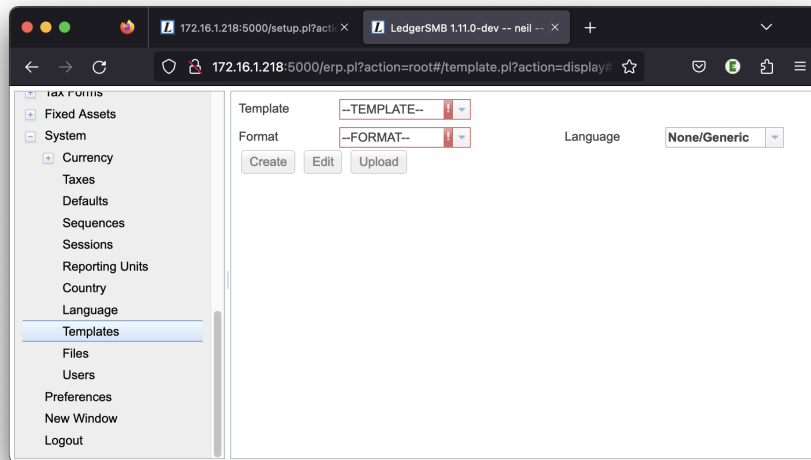


Figure 18.5: System templates screen

\LaTeX templates

To change a \LaTeX template navigate to `System → Templates`. Select, for example, Template "Invoice" and Format "tex", you should see the view shown in Figure 18.6 on page 118

To add a file to the latex template, first upload the image file to the database. This can be accomplished by navigating to `System → Files`.

To include this graphic file in your \LaTeX document, it needs to be retrieved from the database and temporarily stored in a location accessible to the PDF generator. Once the file is in the database, then the function `dbfile_path` handles that.

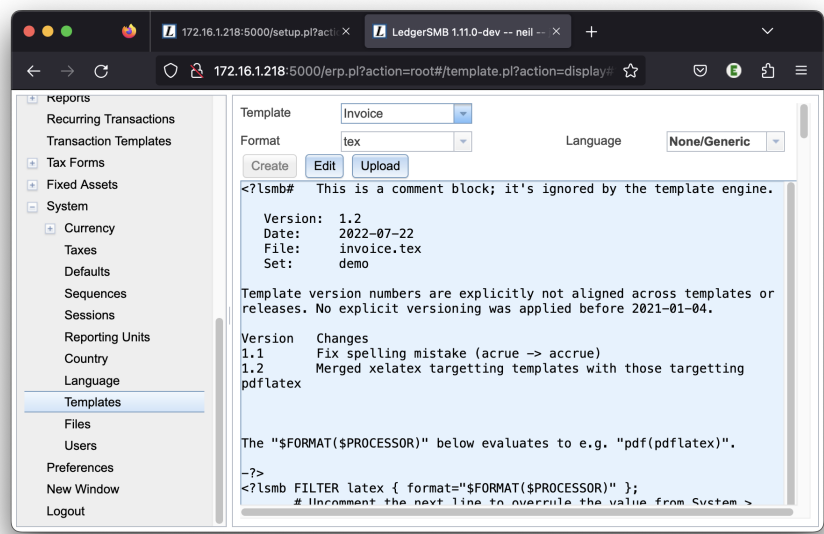
For example, If the graphic file is named "FL_Logo_icon_250x250.png", then add something like the following to the \LaTeX template using the `Edit` button.

```
\parbox[b]{.1\textwidth}{%
  \includegraphics[scale=0.7]{%
    <?lsmb dbfile_path("FL_Logo_icon_250x250.png")?>}
}
```

After editing the template must be uploaded to the database using the `Upload` button.

HTML templates

@@@TODO Add HTML specific template info.



CSV templates

@@@TODO Add CSV specific template information here.

Part IV

Administration

Chapter 19

Overview

19.1 Introduction

This part of the book describes the tasks and processes that may need to be carried out on a regular basis in order to keep the application in good health and in line with requirements from end users.

Maintenance may require different types of system access for different types of tasks:

1. Within application tasks, such as user management, require an appropriately authorized application login
2. Database administration tasks, such as creation of backups and application upgrades, require a database level login to be used with (amongst others) 'setup.pl'
3. Other system-level maintenance tasks, such as updating PostgreSQL or Apache, which require user accounts on the server hosting LedgerSMB

Each of the above tasks requires its own type of user account. Creating and managing accounts for the first type of task is the subject of the next chapter.

Chapter 20

First Use

This chapter covers the general steps to use when installing LedgerSMB for the first time. If you elected to skip Part II Getting Started of this document then this summary will help you with the main steps normally required after installation to get LedgerSMB up and running.

It is assumed that:

- you have followed the installation instructions and have a working install. if not, then see the install instructions at @@@TODO.
- you have setup the company database using `setup.pl`. if not, then see the instructions at @@@TODO.
- you have created an admin user with all privileges. if not, then see the instructions at @@@TODO.

The basic accounting system setup steps are:

1. Create a new password for the user using `Preferences → Password`.
2. Setup the company defaults in `System → Defaults`.
3. Edit the Chart of Accounts as necessary using `General Journal → Chart of Accounts`. This includes setting up your bank account.
4. Enter or import customers.
5. Enter or import vendors.
6. Enter or import products or services.
7. Customize Sales Order format.
8. Customize Sales Invoice format.
9. Customize Purchase Quotation format.
10. Customize Purchase Order format.
11. Testing your setup.

Chapter 21

Within-application tasks

@@@TODO

Chapter 22

DBA tasks from setup.pl

@@@TODO

Chapter 23

Outside-application tasks

@@@TODO

Chapter 24

User management

@@@TODO

24.1 Introduction

This chapter deals with management of application level user accounts. This is the first of the three types of system access required to do LedgerSMB administration described in the previous chapter.

24.2 User creation

Users experienced with LedgerSMB 1.2 or before or SQL Ledger (any version) are referred to appendix A.1 to read about the differences with version 1.3.

In order to create users, the current user must be sufficiently authorized. The user created at application set up time is such a user.

Go to the `System → Admin Users → Add User`. You'll be presented the page as shown in figure Figure 24.2 on page 131.

The value entered in the 'Username' field will cause a database user by that name to be created. Database users are a global resource, meaning that a collision will occur if multiple people try to define the same user in multiple companies. Section 24.5 on page 135 describes how to use the same user across multiple companies.

Enter the password to be used for this user into the "Password" field. If you're importing a user, please leave the field empty – that will prevent the password from being changed. Note that initial passwords (and password resets) are only valid for one day unless the user logs in and changes his/her password.

The "Import" field is discussed in Section 24.5 on page 135. To create a new user, leave the setting at "No".



The screenshot shows a web form titled "New User" with a black header bar. The form contains the following fields and controls:

- Username:** A text input field.
- Password:** A text input field.
- Import:** Radio buttons for "Yes" and "No", with "No" selected.
- Dr.:** A dropdown menu showing "Dr." with a downward arrow.
- First Name:** A text input field.
- Last Name:** A text input field.
- Employee No.:** A text input field.
- Country:** A dropdown menu showing "Netherlands" with a downward arrow.
- Save User:** A button at the bottom left.

Figure 24.1: Screen for user creation - step 1

All of the "First Name", "Last Name" and "Employee No." fields are required. However, when no employee number is specified, the system will generate one using the sequence specified in the Defaults screen as documented in Section 18.4.3 on page 113.

The "Country" field speaks for itself and is required as well.

24.3 User authorization

After filling out all the fields as described in the previous section and clicking "Save user", you'll be presented a second screen in the user creation process: the user authorization screen. See Figure 24.2 on page 133 for a screenshot of the top of that screen.

The process of assigning user authorizations is the process by which the granted access to specific parts of the application. One can imagine that - in a moderately sized company - sales should not be editing accounting data and accountants should not be editing sales data. Yet, in order to cooperate, both parties need to be given access to the same application. This is where authorizations come in.

In aforementioned screen, which equals the "Edit user" screen, you have to assign the newly created user his application rights. By default, the user doesn't have any rights. Checking all check marks makes the user an application "super user", i.e. gives the user all available application rights.

For a description of the roles a user can be assigned and their effects, the reader is referred to Appendix E starting at page 243.

Editing User

Username admin

Password

First Name Erik

Last Name Hulsmann

Employee No.

Set Password [\[Edit\]](#)

- ☐ account all
- ☐ account create
- ☐ account edit
- ☐ ap all
- ☐ ap all transactions
- ☐ ap all vouchers
- ☐ ap invoice create
- ☐ ap invoice create voucher
- ☐ ap transaction create
- ☐ ap transaction create voucher
- ☐ ap transaction list
- ☐ ar all
- ☐ ar invoice create
- ☐ ar transaction all
- ☐ ar transaction create
- ☐ ar transaction create voucher
- ☐ ar transaction list
- ☐ assembly stock
- ☐ assets administer

Figure 24.2: Screen for user creation - step 2

24.4 Maintaining users

24.4.1 Editing user information and authorizations

When the role of a user in the company changes, it may be necessary to assign that user new roles and possibly revoke some other roles. This can be done through user search: System → Admin Users → Search Users → Search → [edit] which brings you to the same screen as presented in Figure 24.2 on page 133.

Similarly, there may be reasons to change the user information, such as a last name (e.g. upon marriage).

Note that if you reset a password, the new password is valid for one day unless changed. The preferred business process is for the individual with permissions to reset the password, give the new password to the user, they then log in and immediately change it.

24.4.2 Changing user preferences

Each user can change his preferences and password through the Preferences top level menu. See Figure 24.3 on page 134.

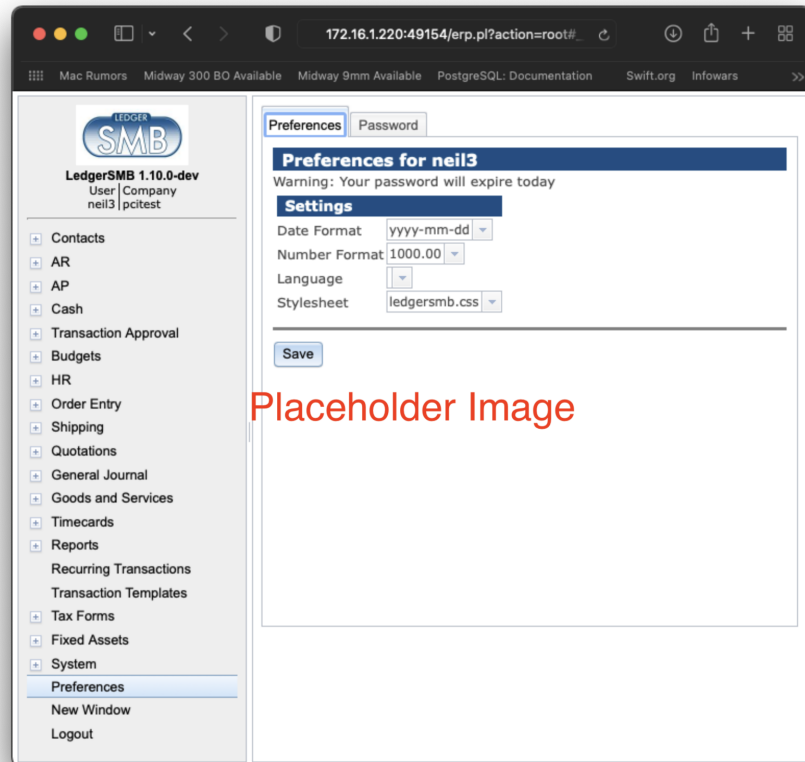


Figure 24.3: User preferences screen

24.4.3 Deleting users

From the “User search” result screen, users can be “deleted” from the company: they have their access to the current company revoked.

Note that the user is only revoked access to the current company; the login remains a valid login for the database cluster. Administrators wanting to remove user accounts at the database level need to take additional action.

24.5 User imports

If a database user already exists, e.g. because this user was created to be used with another LedgerSMB company, it can't be created a second time. In order to be able to use that user with the current company, it needs to be "imported" instead.

The difference between creating a new user and importing one is that the "Import" radio button should be set to "Yes" and that you should not fill out a password. If you do, the password of that user will be overwritten for all companies.

All other fields are still applicable: the data entered for other companies isn't copied to the current company.

24.6 `setup.pl` users

As mentioned in the introduction, users created through the process documented above don't have rights to execute work with the `setup.pl` database administration tool. Note that this is on purpose. You will need access to the server to create such users, or request one from your application service provider (ASP) if you use a hosted solution.

During the set up process such a user is normally being created. This user can later be used to manage the database from the database administration tool `setup.pl`.

Chapter 25

Definition of goods and services

25.1 Definition of goods

Structure of products in the system.

25.1.1 Definition of parts

The part entry screen consists of four parts:

1. Part information
2. Vendor information
3. Customer information
4. File attachments

The paragraphs below discuss each of the four sections. The part definition section contains both required and optional fields. The information in the remaining three sections is entirely optional.

Part information

Every part requires the following fields to be entered:

Number

The (alphanumeric) code the company uses to identify the item

Description

The (native language) description of the item, used as the default description on sales invoices

Inventory account

The asset account used to maintain the monetary equivalent of the inventory amount

Income account

The P&L (income) account to post the sales revenues on

COGS account

The P&L (expense) Cost of Goods Sold (COGS) account to use to post cost of sold items on

Sell price

The default selling price used on sales invoices

The other fields in this section of the screen are optional:

List price

Informational; can be used for any (monetary) purpose

Last cost

Last buying price, updated when a vendor invoice listing the current part is posted

Markup percentage

Markup on Last cost to calculate the Sell price

Image**Drawing****Microfiche****Unit**

A five-character field shown on the invoice

Weight

Informational; can be used by add-ons or when customizing

ROP

Reorder point - when the inventory drops below this number, the part will show up in "Short parts" reports

Bin The storage location in the warehouse

Apart from these fields, there are also the Make and Model paired fields. Every part can have as many Make/Model lines as required. They are informational, but can be used when customizing the software.

The Average Cost and On Hand fields are output-only calculated fields. Average Cost is calculated from the historic buying prices. On Hand is the current inventory, which is updated when posting a vendor invoice (increased) or sales invoice (decreased).

Taxation of parts

Right below the accounts selection section, there is the Tax section, which lists all tax accounts with a check mark. Each account corresponds with a certain tax type and rate. E.g. in the Netherlands, there's one VAT tax type (BTW) which has two rates, one of which applies to every product. This setup requires two accounts. There's more on the subject of sales taxes in Chapter 26 starting at page 143.

By checking the check mark on an account, the system is signaled to calculate that kind of tax for the part *if the customer (or vendor) has the appropriate setup* as described in section

Vendor information

This section of the screen lists one or more vendors from which the part can be purchased, with purchasing information for the given vendor:

Vendor code

Code used by the vendor to identify the good, to be used by and future customization and enhancements (currently informational only)

Lead time

Lead time of the part from the vendor in days

Last cost

Last price at which the good was purchased from the vendor

Currency

The currency belonging to the Last cost field

Customer information

The customer information section specifies sell prices per customer or price group where those are required to deviate from the default sell price. This mechanism exists to support the marketing principle of categorizing customers.

Sell price

Price for this part to be used for this customer

From

Start of the applicability window of the price (inclusive)

To End of the applicability window of the price (inclusive)

File attachments

The process of attaching files to parts is very similar to that of attaching files to quotations, which is covered in Section 34.3 on page 169.

25.1.2 Definition of part groups

When adding parts, services, or overhead in Goods and Services they can be categorized in 'part groups'. When searching, the part group can help to limit the number of matches. Currently, this is the only use of 'part groups'.

Parts groups have a name and an – optional – parent. When selecting a parent, this creates a hierarchy of parts groups which can be used when searching for parts: selecting a parent parts group as a filter on parts search will include all parts in the groups for which the selected group is the parent.

When no part groups have been defined, the part group assignment field doesn't show up on any of the goods entry screens. Part groups never show up on the add assembly screen.

There's no requirement that a good be assigned to any specific part group.

25.1.3 Definition of assemblies

25.1.4 Definition of overhead or labor

25.1.5 The use of parts versus assemblies for multi-item-package sales

Often times, one may want to sell pre-packaged multiples of a single item, such as Jack in Chapter 7 starting at page 61 who wants to sell memory modules in pairs as well as single items, with the price for the pair set separately from the single-item price.

There are basically two use-cases

1. Pre-packaged sales which are separately stocked
2. Single item sales which are achieved by unwrapping the multi-item packages

The former case would be that of a supermarket selling packages of coffee in singles and shrink-wrapped in pairs. These items get stocked, sold and produced separately. Handling these is straight forward: as they are basically separate products from the point of administration and inventory management, they're handled as separate parts.

The latter case would be Jack's case where single-item sales is achieved by unwrapping a multi-item package. Basically, there's a single inventory for both types of packaging. This situation can be handled (a) by creating separate parts or (b) by creating a part and an assembly. To reiterate: The fact that one wants to be able to separately set a pricing strategy for the bundled items is the driver to go look for other solutions than just sell a multiple of the original item.

There is no option which matches the actual practice: one inventory for two parts. The solution always will keep two separate stocks for the two items,

but one may work better in practice than the other.

Option a (separate parts) keeps the inventory of both items strictly separate, meaning there's no way to convert between the two, other than selling and buying.

Option b (a part and an assembly) mismatches reality in so far that it will require one to stock the single items and update the assembly stock regularly while in practice the multi-item packages are stocked and unwrapped upon single-item sales. This procedure works to have the assembly stock go negative on sales and restock regularly (e.g. daily) to update assembly stock back to 0 (zero). This removes inventory from the single-item stock, allowing for a semi-automated way to convert stock from one type of inventory to another.

25.2 Definition of services

25.2.1 Taxation of services

25.3 Alternative accounts (GIFI)

Next to the regular account numbering scheme, LedgerSMB supports a second numbering scheme: GIFI numbering. GIFI is a standardized account coding system used in Canada by the Canada Revenue Agency for processing corporate Tax Returns forms.

Other countries (e.g. France) may have required numbering schemes for corporate accounting as well.

If you use GIFI account numbers, each account is associated with a GIFI account. Multiple accounts may map to a single GIFI account.

Many General Ledger reports exist in two variants: a variant using the normal G/L accounts and one with the GIFI numbering scheme. In the GIFI variant, when a single GIFI has multiple accounts, the total reported under GIFI is the sum of the mapped accounts.

25.3.1 Maintaining GIFI

GIFI accounts should be created before being assigned to a standard G/L account. GIFI accounts can be maintained through the `System → Chart of accounts → Add GIFI` and `List GIFI` menu items. Existing accounts can be edited by selecting them from the `List GIFI` menu, which opens a page where individual GIFI items can have their number or description adjusted.

25.4 Reporting

As for the general journal being presented in the "ordered by account" and "ordered by date": these are both in the "General Journal & Search" menu.

Once you run the report, you can sort the lines by date (journal) or by account (which I believe is sorted by date within the account). My accountant either lists "all transactions for one specific account" or "all transactions for 202x; all accounts" so usually, sorting by date isn't much of an issue.

I believe that in the "General Journal & Search" search options, you may need to check the "Account" indicator to add the account to the output. This comes in handy when you decide not to filter for a specific account.

@@@ Needs Editing

Chapter 26

Taxes

26.1 Overview

When an account has been marked as a Tax account (see Section 18.3.3 on page 104, item 18.3.3) several things happen:

- The account will be shown in the customer and vendor account screens with a check mark to mark it “relevant for the customer”
- The account will be shown in the part and service configuration screens with a check mark to mark it “relevant for the part/service item”
- The account will be shown in the tax configuration screen in order to set a tax percentage on the account as discussed in the next section

By marking an account relevant for a customer, taxes will be calculated when creating a sales invoice for the given customer which includes parts which also have the specific account marked as relevant.

26.2 Tax account configuration

The screen (shown in Figure 26.2 on page 143) presents a table with the full history of the percentage rates, their dates of applicability and the tax accounts they apply to. An account can show up any number of times, with different Valid To dates.

Account name

The first column; not an input field

Rate (%)

The rate to be applied to the sales amount

	Rate (%)	Min Taxable	Number	Valid To	Ordering Tax Rules
Sales Tax	5.000	0		infinity	0

Figure 26.1: Tax account configuration screen

Min Taxable

The minimum amount for which the tax is applicable

Number

The tax reporting number to be used for this tax

Valid To

Date until which the tax rate is applicable

Ordering

The meaning of this field is described below

Tax Rules

The selection list presents a list of available 'tax rules engines'. By default the list consists of the 'Simple' module only, which is the engine which comes with LedgerSMB; the reader is referred to Section 26.4 on page 145 for a more detailed description of this subject

To determine which line is applicable at any time, order the lines by their validity date and select the first one for which the validity date is later than the date being checked for. E.g. if you have two lines - one with a Valid To date of 2010-01-01 and one with a Valid To date of "infinity" - the 2010 line would be selected when checking for a date in 2009 while the "infinity" line would be selected for any date later than Jan 1st, 2010. This facilitates advance entry of a new tax rate in case of a rate change if a tax rate changes: the new rate will automatically be selected beyond the validity date of the old rate.

The order field is used to layer taxes, e.g. Canada where the province of Quebec taxes the taxes collected by the national authority, which works like this numerically: National tax with order 0 and rate 10% and Quebec tax with order 1 and rate 5% applied to a 10\$ amount charges 1\$ of national tax and 0.55\$ of Quebec tax (5% of 11\$).

Note that - as pointed out in the Overview section of this chapter
- the customer related tax calculation on invoices is triggered by

the settings in this chapter as well as the customer/vendor settings described in Section 33.2 on page 163 and part settings and service settings described in Section 25.1.1 on page 139 and Section 25.2.1 on page 141 respectively.

26.3 Tax calculation examples

@@@ TODO

26.4 Tax calculation plug-ins

The tax calculation system has been designed to handle the most complex tax system thinkable. Because the tax calculation rules for most set ups aren't really all that complex, LedgerSMB comes with a single tax calculation plug in out of the box: the "Simple" tax calculation rule.

For more complex needs, more complex routines can be developed and plugged into LedgerSMB side-by-side with the simple rule.

26.5 Tax forms

The tax forms facility exists to help file sales tax forms. It's primarily modeled after the 1099 US tax reporting forms functionality, which means that it's cash based. The fact that it's cash based means that invoices will be included in the tax report as soon as cash for the invoice is received. Accrual based reporting means that the tax is reported based on the invoice date instead of the payment date.

This system can only be used in some EU countries and by some companies at that: the country needs to allow cash based reporting and the company needs to have filed for cash based reporting as well.

Before using this functionality be sure to check with an accountant or the tax authorities if cash based reporting is appropriate.

26.5.1 Overview

Tax forms are meant to support tax reporting requirements in the countries where the company has tax reporting obligations. This means that tax forms are country specific: each country for which reporting obligations exist needs to have its own form associated.

In order to be able to collect taxes in a tax form companies need to be linked to it. Section 33.2.2 on page 164 describes how to do this.

When associations have been set up between companies and tax forms, the “Tax form” check mark can be used in invoices to include (or exclude) invoice lines from the tax form. See Section 37.2.1 on page 178 for entry of invoices.

Note that there’s a module available for 1.3 which implements accrual based tax reporting by the name of EU VAT reporting. This module replaces the default tax reporting functionality meaning one can only have accrual based or cash based reports in a single company at this time, but not both.

26.5.2 Creating tax forms

Tax forms can be created (or edited) using the menu options available under the “Taxforms” main menu item.

Tax forms have three fields.

Country

Country to which the tax form applies

Description

Name of the tax form to be displayed in drop down lists

Select by Default

Chapter 27

Pricing

27.1 Introduction

There are a number of mechanisms which interact to create a price for an item on an invoice, order or quote:

1. Through direct entry on the document being created (either the price, the discount or both)
2. Using the "Sellprice" (or "Last cost" @@@ really?) on the parts entry screen
3. Using a "Type of Business" associated discount
4. Using the price matrix functionality, which combines (for customers), from least to most specific:
 - (a) A price group
 - (b) A customer
 - (c) A minimum order quantity

The price matrix for vendors is simpler and only includes the vendor as a selection criterion.

The price matrix can be used to set a price, a discount or both. Do note that the customer's payment terms may cause another discount to be applied for early payment. This type of discount is not part of the topic at hand.

This chapter deals with business type and price matrix discounts.

@@@ types of business are 'old school'; price groups have been introduced to replace types of business with a more fine-grained structure.

27.2 Definition of types of business

Types of business are really straight forward: they feature a description which allows them to be identified in the customer account screen and a discount percentage which is applied across the board. I.e. all invoices to the customer will have that discount applied.

27.3 Definition of price groups

Price groups feature only a description and constitute a category. Customers can be assigned a price group (but this is optional). In case a customer is in a price group, this price group is taken into account when determining a price for an item through the price matrix.

27.4 Using the price matrix

At the lower half of the parts and services definition screen, there are two sections; one with the first heading being “Vendor” and the other with the first heading being “Customer”. These are the vendor and customer price matrix sections for the given item. As the customer price matrix is both more complex *and* much more interesting from a functional perspective, this section will only cover the customer side.

The customer price matrix lists the following fields:

- Customer (and customer account)
- Price group
- Discount (optional)
- Sell price (optional)
- Currency
- From (date)
- To (date)
- Minimum quantity

At most one of the “Customer” and “Price group” values should be set; in case a price group has been selected, the row applies to all customers which have been assigned that group in the customer “Account” page. If there is a row listing the customer explicitly as well as one for the customer’s price group, the most specific one – the customer – is taken. If neither a customer nor a price group has been entered, the row applies to all customers.

When applying the price matrix algorithm, the Currency, From, To and Minimum quantity values restrict applicability of the row: the invoice's currency needs to match, the invoice date must be between From (inclusive) and To (inclusive). The row with the highest value in Minimum quantity which is lower than the total number of items specified on the invoice is selected.

To visualize the algorithm, please consider the following examples.

27.4.1 Price matrix example: simple pricing

Consider customers A and B and a part with a generic "Sell price" of 110.00. The simplest price matrix for a part, could look like:

Table 27.1: Customer specific price matrix

Customer	Price group	Discount	Sell price	Currency	From	To	Min Qty
B			99.00				

When creating an invoice for customer A (not in the prices matrix), the part will be listed at generic sales price of 110.00 while at the same time an invoice for customer B lists it at 99.00.

If customer B had been in the "Frequenters" price group, and the matrix had looked like this:

Table 27.2: Price group specific price matrix

Customer	Price group	Discount	Sell price	Currency	From	To	Min Qty
	Frequenters		99.00				

The outcome would have been exactly the same. Discounts are determined exactly the same way as absolute prices, when the "Discount" field is set.

27.4.2 Price matrix example: Quantity pricing

Consider a part with a generic "Sell price" of 110.00 and the price matrix below, which includes "Minimum quantity" pricing:

Table 27.3: Price matrix configuration

Customer	Price group	Discount	Sell price	Currency	From	To	Min Qty
			99.00				200
			90.00				400

With this price matrix in place, any customer ordering up to 199 items will pay 110.00 per item, whereas orders of over 400 items will cost 90.00 per item and every order in between will be 99.00.

27.4.3 Price matrix example: Time-based (Sale) pricing

Consider a part with a generic “Sell price” of 100.00 and the price matrix below, which includes time-based pricing:

Table 27.4: Price matrix configuration

Customer	Price group	Discount	Sell price	Currency	From	To	Min Qty
		30%			Oct 15	Oct 31	

Any invoice outside the interval Oct 15th through Oct 31st will list the part at a price of 100.00. During the interval the listed price will be 70.00.

Chapter 28

Auditing

There's an audit-trail table which tracks (and this can't be disabled) who changed what in the transactions you post. This table isn't currently visible in the application; it's not hard to make it visible. However, when we look at what auditing usually means, it is that you're able to completely demonstrate everything that happened to your books while compiling your accounting data. That is: you can show that the invoices sent to your customers are the same as shown in the system. Also, auditors want to see completeness: that you've recorded all invoices sent out in the books and that all work performed has been invoiced.

For completeness, we have "gap-less numbering" for invoices. That means the system generates invoices with numbers that are always exactly 1 apart. so when a number misses, you know the books have been tampered with.

There's another thing with LedgerSMB that helps auditability: transactions can't be deleted or changed once they have been posted. Some people hate that: they find mistakes and it's a lot of work to correct those. Also, large vendors like Quickbooks, Sage and Xero allow changing transactions after they are recorded in the books (but they have a special "auditor mode" which shows the old versions of the same transaction).

@@@ Needs Editing

Chapter 29

Contingency planning

29.1 Backup and restore

29.1.1 Backup using setup.pl

29.1.2 Backup using PostgreSQL administration tools

29.1.3 Restore

Note that if the database being restored is a backup from a different (earlier) PostgreSQL version, additional steps described in Appendix D.6 starting at page 239 will be required.

29.2 Advanced PostgreSQL: replication

Chapter 30

Software updates

30.1 Introduction

This chapter describes patch and minor version release updates from 1.4 or higher. Upgrades from older versions (e.g. 1.2 or 1.3) are covered in Appendix D starting at page 237. The same is true for upgrades from SQL Ledger 2.6 or 2.8.

The remainder of this chapter discusses the steps to be executed. Please note that during execution of the instructions below the application isn't to be used.

30.2 Backups

All upgrades should start by creating backups of the system as it runs. This means:

- Backup database roles (authorizations)
- Backup database content (structure and data)
- Backup software and settings files

The database content and roles backups can be created through the `setup.pl` web interface. The database content backup can also be created using the `ledgersmb-admin` administration command line tool.

A backup of the software itself is only relevant when using a source installation. When using the (recommended) Docker installation, this step can be skipped; it *is* important to record which image version the container is based on. For source installs the backup can simply be performed by recursively copying the containing directory: `cp -Rp /srv/ledgersmb /srv/ledgersmb.bak`

30.3 Software upgrade

When using Docker, the upgrade is as simple as spinning up a container with the new version. For source installation the procedure is simple as well: The tarball needs to be unpacked, replacing the existing sources. From the archive directory, the file `ledgersmb.yaml` (or `ledgersmb.conf`) must be copied. The same needs to be done for any custom CSS theme files in the `UI/css` directory.

If your setup is using the deprecated `ledgersmb.conf` INI-style configuration file, you should use the migration utility `utils/migration/convert-ini-to-di` to generate the new YAML-based configuration format `ledgersmb.yaml`.

30.4 Database upgrade

After upgrading the installed software, all LedgerSMB company databases need to be upgraded in order to become compatible with the new software. This applies to minor as well as to patch releases: next to tables the schema also contains a large number of functions. While it's policy for the project not to change the table structure in patch releases, these functions may need to be changed as part of a patch release.

The upgrade is performed by logging into the database through `setup.pl`. After successful login, the question "LedgerSMB X.YY db found. Rebuild/Upgrade?" with a `Yes` button right below. "X.YY" is the version you had running before starting the upgrade process.

After clicking the `Yes` button a series of database upgrade scripts will be executed. Prior to executing each script, checks will be performed to test whether the upgrade can be successful. If these checks find problems that need to be resolved before running the script, it will show a webpage listing offending data with instructions on how to resolve the situation.

Important This database upgrade process is one-directional. Once started there are no scripts to reverse the process. The only option to back out of the upgrade is by restoring the backup created at the start of the process.

The community is always interested in improving the upgrade experience, so when stuck it's highly advised to contact the developers on their mailing list (`devel@lists.ledgersmb.org`), log an issue in the issue tracker (<https://github.com/ledgersmb/LedgerSMB/issues>) or join the chat channel (<https://app.element.io/#/room/#ledgersmb:matrix.org>) to report the problem.

Chapter 31

Optional Features

As business requirements change sometimes it may be necessary to add or remove some of the optional features of LedgerSMB. This chapter describes how these optional features work, how to troubleshoot them if things go wrong, and how to enable or disable them.

31.1 PDF and Postscript Documents

LedgerSMB can create PDF and Postscript documents for orders, invoices, and more. This is an optional feature and requires some additional software not included with LedgerSMB, including a \LaTeX distribution and extensions to Perl's TemplateToolkit framework.

The PDF and PS invoices are generated using a program called \LaTeX which handles the layout and typesetting. The actual \LaTeX files are created using Template Toolkit with extensions for \LaTeX . These extensions are in the Template::Latex package available from CPAN. The software then generates a \LaTeX file which is then processed to create a PDF or PS.

Typically the first thing to do is to install a \LaTeX distribution like TexLive (distributed with many Linux distributions and available for OSX and Windows). This provides \LaTeX and many of the modules needed. In general I recommend that if your distro has a texlive-extras package that you install this too.

After this is installed, you must then install Template::Latex. This can be done by typing on the command line:

```
# cpan Template::Latex
```

This will also install a number of dependencies including LaTeX::Driver, which will need to know where your LaTeX binaries are. It is usually pretty good at finding them.

If things go wrong and you can't get it to work, the following commands may provide useful diagnostic information when requesting help:

From the LedgerSMB application directory: `$ perl -MLedgerSMB::Template::Latex -e print`

From the doc/manual directory in the LedgerSMB application directory: `# pdflatex LedgerSMB-manual`

31.2 Attaching Uploaded Files to PDF Invoices

31.3 OpenDocument Spreadsheet Output

31.4 Microsoft Excel Output

Part V

Business processes

Chapter 32

Overview

This part of the document describes how LedgerSMB handles specific business processes. For example, Order Entry, Shipping, etc.

Some of these processes may not apply to your specific use of the software and can be ignored.

Chapter 33

Customers and vendors

33.1 Introduction

This section describes how LedgerSMB implements customers and vendors.

When creating a customer or vendor in LedgerSMB, you have to first create a contact. This contact can be created as either a company or person. However, this contact can't itself be used directly as a vendor or customer. Instead, you have to create a "credit account" which is linked to the contact. A "credit account" can have the role of vendor, customer or both.

LedgerSMB works equally well using a person as a vendor, customer, or both.

A contact can have multiple customer and/or vendor type accounts. Each account has its own language settings, shipping address, contact data and payment conditions. Basically, you will create multiple accounts when you have to record different data for any of the items listed above.

Note that at least as of LedgerSMB 1.9, a contact can only be linked to one bank account. This means that if your contact as a vendor has separate bank accounts from your contact as a customer, you will need to set them up as different contacts.

The contact entity itself is used - albeit not as customer or vendor - in the context of credit risk management (See Chapter 41 starting at page 189).

33.2 Creating customers and vendors

The typical procedure to create customers and vendors works exactly alike:

1. Create the contact as a company
2. Create credit accounts
3. Attach addresses, contact info and notes to the accounts

33.2.1 Creating a Company

To create a company navigate to Main Menu → Contacts → Add Contact → Company Tab.

The company tab has the following fields:

Control code

Code to uniquely identify this entity. This is usually generated by clicking on `Generate Control Code` button. It is also generated automatically when clicking the `Save` button.

Class

The type of entity; vendor, customer, etc. Required, but defaults to a known value so it needs to be checked.

Name

Legal name of the company. Required.

Country

Country of incorporation. Required, but defaults to a known value so it needs to be checked.

Tax number/SSN

Tax (VAT/Sales tax) number of the company.

Sales Tax ID

The sales tax reporting number.

License Number

The company operating license number.

The `Generate Control Code` button generates a new control code upon user request when the user is entering a company which isn't yet known in the system in any other role.

The `Retrieve` button is discussed in Section 33.4 on page 166.

The `Save` button creates the account.

33.2.2 Creating a customer account

When a contact of class "Customer" or "Vendor" has been created, accounts of that type can be added. The account entry screen lists the following fields¹:

Class

Either a customer or vendor

¹To simplify the interface if they're unused, some fields are not shown in case their selection lists are empty

Number

Number to identify this account among all other accounts in the company; when left empty, the system will generate one when you click "Save New"

Description

Textual representation of the account, usually a name

Pay To

@@@TODO

Starting Date

Date from which the account is valid

End date

Date until which the account is valid, or empty if there's no known end date

Threshold

Minimum amount for invoices to be sent out

Credit limit

Maximum amount of open invoices and orders allowed for the account, see Chapter 41 starting at page 189

Payment Terms

Number of days within which invoices have to be paid

Discount (conditions)

Percentage discount the account is entitled to when payment is within the given number of days

Discount (account)

Account used to post discounts as calculated based on discount conditions

AR For customers, the Receivables G/L Account used to post created sales invoices on

AP For vendors the Payables G/L Account used as default to post received purchase order invoices on

Payment

Which bank account to use when receiving or paying funds

Currency

The default currency to be used with the customer or vendor

Language

The language parameter is used to select templates for communication with the customer

Taxes

The applicable tax form for this vendor; tax forms are discussed in more detail in Section 43.7.2 on page 201 Chapter 26 starting at page 143

33.2.3 Creating a vendor account

Generally the only difference between creating a customer account and a vendor account is the Class and the use of AP or AR G/L accounts. See Section 33.2.2 on page 164 for setting up a customer account.

33.3 Multiple customers within one company

33.4 Creating vendors from customers

33.5 Maintaining contact information

Chapter 34

Quotations from Vendors and for Customers

34.1 Creating Quotations and RFQs

The screenshot shows the 'Add Request for Quotation' screen in LedgerSMB 1.3.22. The interface includes a sidebar menu on the left with options like AR, Point of Sale, AP, Cash, Transaction Approval, HR, Order Entry, Shipping, Quotations, RFQ, Reports, General Journal, Goods and Services, Projects, Reports, Recurring Transactions, Tax Forms, Fixed Assets, Batch Printing, System, Stylesheet, Preferences, and Logout. The main form area contains fields for Vendor (ABC Parts), Currency (USD), RFQ Number, Quotation Date (2012-10-27), and Required by. Below these is a table with columns: Item, Number, Description, Qty, Unit, OH, Price, %, Extended, and TaxForm. The table contains one row with Item 1, Number q1, Description Samsung 1TB, Qty 10, Unit 10, and Price 10. Below the table are fields for Required by, Group, Notes, and Internal Notes. At the bottom right, there are fields for Subtotal (0.00) and Total (0.00). The bottom of the screen has buttons for Update, Save, Ship to, and Print and Save.

Figure 34.1: RFQ entry screen

Remark Note that the RFQ entry screen contains prices; this is misleading at least: the printed output to be sent to the vendor does not. The fact that this screen allows entry of prices could be considered a bug.

The listing below describes the meaning of the per RFQ fields presented in the screen.

Vendor (Customer)

Name of the company the quotation is requested from (issued to)

Currency

Currency for the intended transaction

Shipping point

Address to ship to ???

Ship via

Shipping method ???

RFQ number

The number of the document (automatically generated when left empty)

Quotation date

Date the document is issued

Required by

Date of the intended delivery of the goods and services requested ???

Notes

Notes to be included on the printed RFQ document sent to the vendor

Internal notes

Notes to be kept internal to the company - not disclosed through the RFQ document

The following per item fields are listed.

Item

Order number of the item

Number

Part number of the item to be ordered

Description

Description or name of the item to be ordered

Qty The number of items to be ordered

Unit

The unit in which the quantity is measured; e.g. 'each' or '6pack'

OH Number of items currently on hand (i.e. in stock)

Price

Item price

% Discount percentage rate

Extended

Item price after discount

TaxForm

SKU

Stocking unit - code used to track stock

Required by

Required date of delivery; can be used to specify a different date than the date in the header

Remarks

Item specific remarks

Group

(Not shown in the screen shot) Part group for the item

Note that the quotation entry screen offers a number of extra buttons after the data has been saved.

34.2 Expediting quotations

34.2.1 Printing

34.2.2 Sending by e-mail

34.3 Attaching files to quotations

Chapter 35

Sales and vendor orders

In this chapter the options for creating orders will be discussed. After successful order creation, there are two possible next steps. The first applies to cases where actual goods have to be handled and goes through shipping and receiving as discussed in Chapter 36 starting at page 173. The other skips handling of goods and directly proceeds to invoicing in Chapter 37 starting at page 177.

35.1 Creating new orders

35.2 Creating orders from quotations

35.3 Creating orders from projects

@@@ What about from time sheets??

35.4 Creating purchase orders from sales orders

35.5 Combining orders

35.6 Recurring orders

35.7 Incomplete orders

Orders fully shipped and invoiced are automatically closed. However, this isn't always an option.

In case an order ends up being partially shipped and parties agree not to ship

the remaining items in the order, the order stays open and incomplete. In situations like these, the order needs to be marked “Closed” in the order entry screen. A note stating why the order was manually closed can be put in the “Internal Notes” input box. Clicking the “Save” button stores the changes in the application database.

Chapter 36

Inventory management

36.1 Shipping

36.1.1 Pick lists

@@ Order picking is the work(flow), not the picklist!

36.1.2 Packing list

@@ Order packing is the work(flow), not the packlist!

36.2 Receiving

@@@TODO the role of shipping points in receipts??

Reception of goods into inventory assumes having at least one saved and incomplete purchase order such as shown in Figure 36.1 on page 174 stored in the system.

The reception process starts by going through the menu to the “Receive” order lookup screen (*Shipping* → *Receive*). This will show the order search screen which will help finding any orders which have items available for reception, see Figure 36.2 on page 175.

After filling order selection criteria and hitting the “Continue” button (or doing so immediately to see all orders with outstanding items in the system), the system will return a listing of orders with matching the selection criteria as in Figure 36.3 on page 176.

Upon selection of one of the orders by clicking the order number the next screen is loaded as shown in Figure 36.4 on page 176. In this screen you can enter the amounts received in the current lot. The entered data is to be confirmed

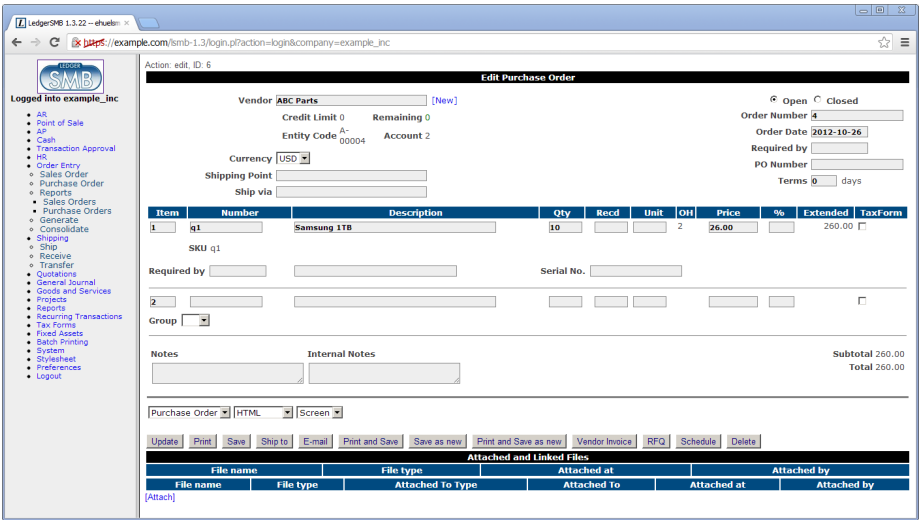


Figure 36.1: Saved purchase order

with the “Done” button. After confirmation of the receipt screen, items will be added to inventory.

LedgerSMB supports warehouse management on the Receipt screen by offering the ability to print a “Bin List”. This list contains the bin (storage) locations configured for each part.

36.3 Partial shipments or receipts

Both shipping and receiving support partial shipments and per-lot invoicing. If the vendor ships multiple lots to a single order (and charges a single invoice), you can simply call up the order and enter items into inventory on the same order. The outstanding items are automatically decremented by the amounts entered before.

To create an invoice for a received lot simply follow the process as detailed in Section 37.1 on page 177. If the lot is a partial shipment, the invoice will be for the current receipt by default.

Receive Merchandise

Vendor

Warehouse

Order Number

PO Number

Ship via

Description

From To

Period ☒ Current ☐ Month ☐ Quarter ☐ Year

☐ No. ☐ ID ☒ Order Number ☒ Date ☐ PO Number

☒ Required by ☒ Vendor ☒ Number ☐ Ship via ☐ Amount

☐ Tax ☒ Total ☒ Currency

☐ Subtotal

Figure 36.2: Search screen for purchase order item receipts

36.4 Handling returns

36.5 Transferring between warehouses

36.6 Inventory reporting

36.6.1 Inventory status report

36.6.2 Inventory activity report

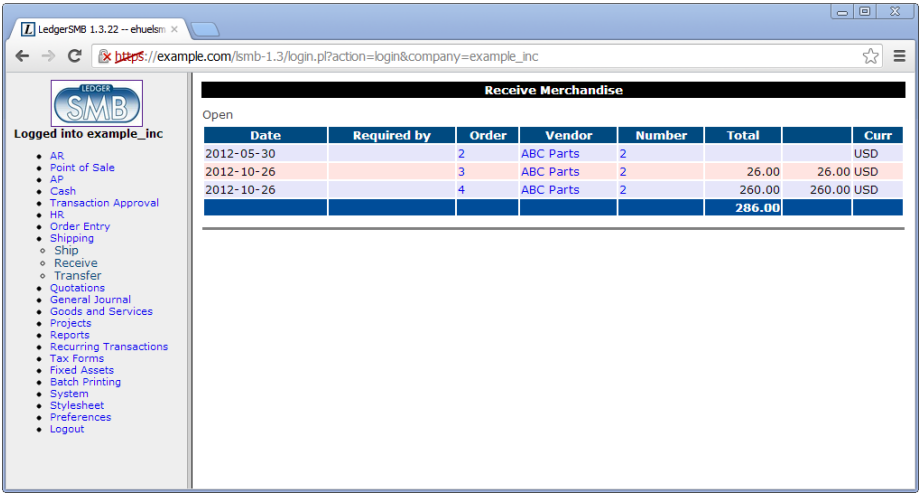


Figure 36.3: Search results screen for purchase order item receipts

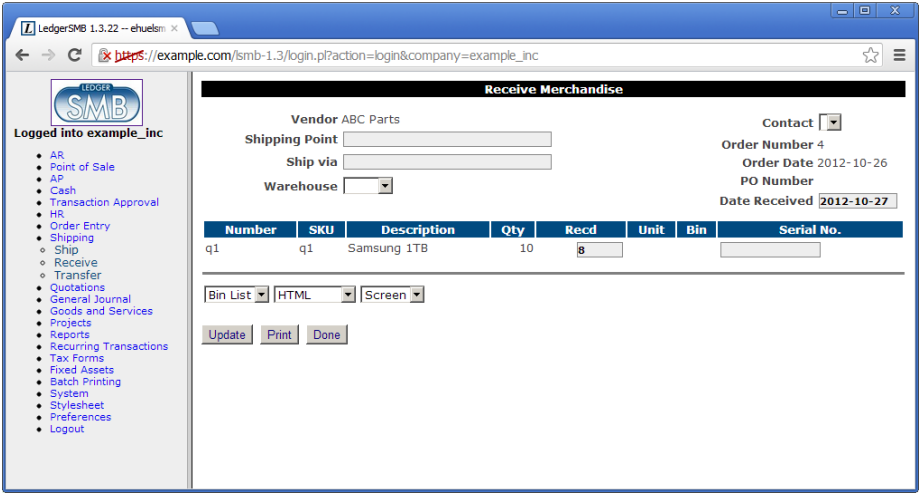


Figure 36.4: Purchase order receipt screen

Chapter 37

Sales and vendor invoice handling

Invoices can come from multiple sources. When the quotation and order management functionalities in LedgerSMB aren't used, they will usually be entered manually. This work flow is covered in Section 37.2. When order management *is* being used they mostly originate from orders which is covered in Section 37.1.

37.1 Creating invoices from orders

37.2 Creating new invoices

When a business decides not to use the order management as per the previous chapter it may find itself in need to manually enter invoices. But even if it does use order management, it may be necessary to enter an invoice directly.

When creating a transaction to record that the company owes another entity (a vendor invoice) or that it has outstanding receivables, LedgerSMB offers two options:

1. Invoices
2. Transactions

Transactions have very limited functionality: they allow a user to enter a debt owed or owned into the AR and AP subsystems. They also require the user to think how the other side of the transaction should be registered; i.e. which cost account the AP transaction should be posted against, or which income account the AR transaction should be posted against. If there are sales taxes applicable, the user is required to manually calculate and enter them.

Invoices offer a much more clever set of functionalities. First of all, it allows the user to create a document to be sent to the vendor or customer. Second, invoices take advantage of parts and services to automate calculation of sales taxes. Third, invoices update inventory for items held in stock (parts, assemblies). Transactions offer none of this.

37.2.1 Invoices

As mentioned in the previous paragraph, invoices can perform automatic sales tax calculations, maintain inventory and post income (or expense) to the correct GL accounts.

To be able to do so, they need the items on the invoice to be correctly configured. See Chapter 25 starting at page 137 how to set up products and services.

37.2.2 Transactions

Transactions serve an important purpose not handled by invoices: payroll calculations are often too difficult to fit in the simple “amount times price” model offered by invoices. In order to still be able to track which “vendor” was paid which amount such payment obligations can be recorded in the AP subsystem with a transaction.

Likewise it’s often more hassle than it’s worth to create the parts and services required to correctly calculate the utility bill. In such cases the transaction (possibly with a linked document as supporting evidence) offers good per-vendor traceable history records.

37.2.3 Email Invoices

Posted invoices can be emailed from the Edit or Add Sales Invoice screens.

When emailing an invoice, the ‘from’ email address will only auto fill when the email address is set in `System → Defaults → Default Email From`.

The ‘to’ email address will only auto fill if a billing email address is set in the customer. Select the company. Then go to `Contact Info` tab. Set ‘Attach to’ to ‘Credit Account’ and ‘Type’ to ‘Billing Email’, add the email address, then click ‘Save Contact’.

37.3 Recurring invoices

37.4 Invalidating invoices

Sometimes, it’s necessary to invalidate an invoice. When an invoice has been posted, this also means derived administrations have been updated, such as

inventory for the items on the invoice.

To undo the effects of an invoice, i.e. to reduce the amount outstanding with a customer, use the `VOID` button on the invoice screen as shown in @@@figref . This creates a new invoice by the same number as the original, except that the new invoice has a suffix `-VOID`.

Unfortunately, in LedgerSMB 1.3 - the earlier versions - voiding an invoice did not automatically close the original and voiding invoices. To close both invoices from the open invoice overview, use the cash receipt process as described in Section 42.2 on page 193 to make a zero amount payment.

37.5 Correcting and deleting invoices

There's only one way to persist an invoice in LedgerSMB: posting it. This means the invoice becomes part of the accounting information. One of the primary properties of an accounting system is to record full audit trails and help enforce internal controls as detailed in Section 2.2 on page 30. Because of that fact there's no way to delete or edit invoices after they have been posted ¹.

The only way to "undo" an invoice is by voiding it. This is important for several reasons:

1. Invoices can't be deleted (because they're accounting data)
2. Invoices pose a claim on the assets of a customer
3. @@@ others?

Specifically item 2 is important: when you sent the invoice to your customer, you effectively sent them a claim. When you decide to refrain from pursuing that claim, you should notify them of that fact so they have the documentation to update their accounting system to reflect that fact: they need your documentation to void their vendor invoice, instead of paying it.

For the same reason it's ill-advised (and no longer supported) to edit invoices: when a customer has multiple invoices, each stating a different amount, all using the same invoice number; how is that customer supposed to document (verifiably) that the claim has been settled satisfactorily by paying the one he did?

See the Remarks section at the end of this chapter for details on how to handle the draft invoice requirement.

¹LedgerSMB currently does not support saving an invoice without posting it. This functionality is on the roadmap for addition when the AR/AP functionality is being rewritten - currently 1.5 or 1.6.

37.6 Handling invoice disputes

When an invoice has been sent to a customer it could happen that the customer disagrees with the invoice due to incorrect amounts, discounts, products, etc.

Depending on whether the customer has already paid the invoice there are several options to handle this situation:

@@@ AR Invoices have nothing to do with it! They parallel AR Transactions!!

Credit invoices

The customer has not paid the invoice yet

Credit notes

The customer has paid the invoice and allows offsetting against other (possibly future) invoices

AR vouchers

The customer has paid the invoice and demands repayment

Note that the naming in the listing above applies to AR items but could equally apply to AP items by replacing the word "Credit" by "Debit" and "AR" by "AP".

37.6.1 Credit and debit invoices

@@@ produce an accounting document to exchange with the customer/vendor

@@@ restock credited parts

@@@ reverse taxes

37.6.2 Credit and debit notes

@@@ generic transaction, not related to orders, inventory or anything else

@@@ amount taken out of an income account, which is to be selected

@@@ i.e. based on the account on which the original income was posted.

37.6.3 AR and AP Vouchers

@@@ like a credit note or debit note, meant to initiate

@@@ a repayment to the customer

@@@ exists as a batch workflow only – to support separation of duties

37.7 Remarks

Why can't I send a draft invoice to a customer and edit it to match their expectations?

You can't edit invoices any more in LedgerSMB 1.3 because it breaks the audit trail in financial accounting. But in fact there's functionality available which is meant exactly for this purpose. It's called "Sales order" and its details are in Chapter 35 starting at page 171. Sales orders can be converted - upon customer approval - into an invoice with a click of a button.

Chapter 38

Shop sales

38.1 Opening and closing the cash register

38.2 Shop sales invoices

Chapter 39

Manufacturing management

39.1 Producing sales orders

39.1.1 Work orders

@@ section misnomer “Work orders” is not a workflow or workflow step

Chapter 40

Managing accounts receivable and payable

40.1 Creating generic AR/AP items

40.2 Handling refunds, over-payments and advances

- this bit is about credit notes and debit notes

40.3 Handling returns

- this bit is about credit (sales) and debit (vendor) invoices

Chapter 41

Credit risk management

41.1 Introduction

A company runs credit risk when it gives credit: it runs the risk of the creditor not paying off its debts. LedgerSMB features two ways to manage the risks involved:

1. Limit management
2. Arrears management

The former tries to limit the risk involved by making sure no customer receives more credit than a certain limit while the latter tries to make sure any over due payments get cashed.

41.2 Limit management

Limit management should prevent a company on one hand from delivering too much to its customers at once and on the other from taking (and delivering) new orders to customers with too high amount of unpaid invoices.

@@@ Where to set up limits

@@@ How to monitor limits

41.3 Granting payment terms

41.4 Managing arrears

As mentioned before, the process of managing arrears is directed toward detecting arrears positions with customers early and taking appropriate action.

41.4.1 Monitoring AR aging

In order to find out about over due invoices, a company should run the AR aging report available under AR → Reports → AR Aging. The initial screen presents parameters for the aging report to be generated.

@@@ discuss parameters

This report shows customers and their outstanding invoices categorized as:

Current

Invoices not over due

30 Invoice amounts over due by 30 days or less

60 Invoice amounts over due by 60 days or less (but more than 30)

90 Invoice amounts over due by 90 days or less (but more than 60)

@@@ Printing / mailing aging reports to customers

41.4.2 Tracking invoice history

After an invoice becomes over due a process will be started to remind the customer of the outstanding amount requiring payment.

In order to keep records of actions taken to chase customer payment, the invoice screen has an "Internal Notes" field which can be edited after the invoice has been posted.

In order to save any edits to that field, hit the "Save Info" button.

Note that the "Save Info" button also saves any changes to the "Tax-Form" column or rather, any information that's not accounting information (posted to the books and thereby fixed) nor information which appears on the invoice - which also should remain unedited in order to be able to generate an exact copy at a later date.

41.4.3 Special treatment of invoices

There may be good reasons to treat some over due invoices differently. E.g. in case payment arrangements have been made with the customer and further standard arrears management would not be appropriate any more.

In this case, you can put an invoice "On Hold". The opposite of being on hold is being active. The AR Aging report allows selection of all invoices, only active invoices (those not on hold) or only invoices on hold.

41.5 Interest on arrears

41.6 Allowance for doubtful accounts

41.7 Writing off bad debt

41.7.1 Direct write-off

41.7.2 Allowed-for write-off

Chapter 42

Receipts and payment processing

42.1 Introduction

Receipt (incoming payments for sales invoices) and payments (outgoing payments for purchase invoices) use the same process. This chapter describes the steps using receipts only for brevity but be equally applied to payments - except when explicitly stated.

42.2 Single receipts or payments

LedgerSMB provides two ways to process receipts (and payments). One for single transactions, the other for batches. The next section discusses the steps to do batch processing.

To record an amount received from a customer as an invoice payment, go through the menus `Cash` → `Receipt` and fill out the search criteria to find the customer from whom the payment has been received. After clicking “Continue” the application lists all matching customers.

Remark The customers listed may not have open invoices. The list only serves to select the customer the user is looking for. To find customers with outstanding balances, please refer to Section 41.4.1 on page 190.

After selecting a customer, the cash entry screen as depicted in [figure reference](#) is shown. This screen looks the same for single receipts or payments. This screen consists of three parts. The upper block lists customer details on the left and transaction details on the right. The middle block lists any (partially) unpaid invoices. The lower block handles over payments.

Note that the cash transaction amount isn't being entered explicitly in this screen: the total is shown on the right of last line above the buttons.

The receipt entry screen can be used to register payment of any outstanding invoices. This is the normal scenario. However, if there are no outstanding invoices, or the amount paid is too high, the transaction should be (partially) recorded as over payment. Over payments can be used to pay off invoices at a later date.

@@@ Discuss the single receipt screen

42.3 Batch receipts and payments

42.4 Check payments

42.5 Using over payments

Currently, it is not recommended to use the over payment functionality.

If over payments are used, the "stored" amounts for later use are not tracked in the normal places. Once over payments have been applied to AR/AP transactions they will be visible, and the totals will show up in balance sheets under the correct asset/liability, but running AR/AP reports for individual vendors/customers will not flag that there are over payments outstanding. The only place to find them is in the specific "Use [AR] Over payments" screen.

To work around the current limitations use transactions and debit/credit notes as follows.

For AR:

1. Create an AR transaction for the overpaid amount
2. Create a credit note for the same overpaid amount
3. Receive the extra payment with the AR transaction, and the credit note shows up on the payment screen where you can apply it to another invoice

For AP:

1. Create an AP transaction for the overpaid amount
2. Create a debit note for the same overpaid amount
3. Receive the extra payment with the AP transaction, and the debit note shows up on the receipt screen where you can apply it to another invoice

Note that this approach triggers two movements on the tax account, in case taxes apply to the customer or vendor. One movement to charge taxes and

one to nullify the previous charge. Additionally one should be careful about invoice numbering when applying this procedure: the two transactions are synthetic (not real invoices) and should probably have invoice numbers outside of the regular numbering range (e.g. with a specific prefix or suffix such as 'OVP-') to prevent the need to report on these invoices to the tax authorities – especially if your jurisdiction requires gapless invoice numbering.

42.6 Receipt and payment reversal

42.7 Over payment reversal

Currently, it is not recommended to use the over payment functionality.

Reversal of over payments is a weak spot in LedgerSMB 1.3: there's no way to reverse or "undo" an over payment incorrectly entered. By consequence this section describes the workaround that's required to achieve the same effect.

This workaround needs an account which can be used to temporarily book income on.

Please note that the income will immediately be reversed, so technically any account can be used. To be able to assert that the entire process has been executed correctly, it's advisable to create a separate account, however, since it can be checked to be zero at the end.

With the prerequisites in place, you should execute the following steps - assuming the amount of the over payment needs to be placed back into a cash account.

1. Create an AR transaction for the company the over payment has been entered on
2. Add a single line to the transaction, with the selected account
3. Put the over payment amount to be canceled out in the Amount field for the line
4. Save and post the transaction
5. Pay the transaction from the over payment
6. Create a "General Journal" transaction debiting the income account and crediting the cash account the over payment was entered from

Steps 1 through 4 prepare the Accounts Receivable module with a transaction which allows the over payment to be used. After step 5, the over payment has been cleared, but the amount is in the wrong place, since it sits in the income account instead of the cash account, which is what step 6 corrects.

The side-effect from this workaround is an AR transaction registered against a customer which can't be reversed: doing so, would result in the reversed

amount ending up in the AR summary account. Using a dummy company isn't an option, because over payments are registered to a specific customer. An over payment can only be used to clear open items on that specific customer.

Note that the above procedure applies to an AR over payment. However, the same steps apply to AP over payments, replacing "customer" with "vendor", "AR" with "AP", "Income" with "Expense" and "debit" with "credit".

42.8 Receipts and payments in foreign currencies

Chapter 43

Accounting

43.1 Separation of duties: Transaction approval

See Section 18.4.3 on page 111.

43.2 Entering non sales transactions

43.2.1 Corrections

43.2.2 Transfer of money between bank accounts

43.2.3 Wages

43.2.4 Entering other general accounting documents

Even though the application handles many general ledger postings as consequences from work flows elsewhere in the system - thus not requiring separate postings - sometimes the need may occur to create manual postings not resulting from AR or AP transactions or till and inventory adjustments.

One example of a case like that is the calculation, and posting of corporate taxes presumably at the end of each accounting period but at least at the end of the book year.

43.3 Bank reconciliation

43.3.1 Importing bank transactions - OFX

@@@ TODO - Quick capture of chat info, needs to be revised and maybe moved to customization chapter.

43.3.2 Importing bank transactions - CAMT.053

@@@ TODO - Quick capture of chat info, needs to be revised and maybe moved to customization chapter.

43.3.3 Importing bank transactions - CSV

Cash → Reconciliation

@@@ TODO - Quick capture of chat info, needs to be revised and maybe moved to customization chapter.

Custom formats can be handled by creating an import file like https://github.com/ledgersmb/LedgerSMB/blob/master/doc/reconciliation/recon_csv.pl

The file should reside in `LedgerSMB/Reconciliation/CSV/Formats/`

A perl sub must exist which is named:

```
parse_<name-of-your-company-database>_<id-of-account-to-reconcile>
```

With a company database name of `testdb` and an account id of 255 the parse code might look like the following:

```
sub parse_testdb_255 {
    parse_n(@_);
}
```

default format is:

```
cleared_date, amount, scn, type
2021-09-01, 25.25, 224435, CHECK
2021-09-01, -30.31, 44351, CHECK
2021-09-02, 100,,
2021-09-02, -425, 3321435,
```

scn = Source Coding Number

43.4 Period closing

Period closing is a concept used by accountants to ensure that accounting data is not allowed to change without proper authority. This helps protect against errors when entering new transactions and fraud. The best practice is to close an accounting period, usually monthly, as soon as it is reconciled.

When a period is closed no transactions can be entered prior to the end date of the period, including previous periods.

To open or close a period the user must have be assigned the `yearend.run` role, then they can navigate to the screen "Period closing dates" using `General Journal → Year End`. For an example, see Figure 43.1 on page 199.

In the bottom part of the screen the user can add a date in the input field and hit the corresponding button `Close Period` to close all periods prior to that date. Note that periods are normally closed one-by-one in successive order.

Re-opening a period also opens all succeeding periods.

Period closing dates

Post year closing

Yearend

Reference

Description

Retained Earnings

3590--Retained Earnings - prior years

Post Yearend

Date	Is Year-end	
yyyy-mm-dd	no	Close Period
2023-12-31	yes	Re-open Period

Figure 43.1: Period and Year End Closing

Note that due to a design limitation prior to the release of LedgerSMB 1.7, invoices in foreign currencies¹ can't be reversed on dates other than their original posting date. That is: they can, but their reversal will result in P&L and balance sheet effects which are not desirable. Since period closing disables posting before a certain date this functionality may have negative side effects in versions prior to 1.7.

43.5 Year-end processing

Year end closing is a concept which prepares the accounting books for the next accounting year. There's no inherent requirement for this process to be run at least once a year. This procedure closes the books up to the given date. If the first book year of the company spans more than a year, then the closing will

¹This pertains exclusively to invoices and transactions in foreign currencies and has no effect in case of invoices and transactions in the default currency.

span more than a given year. If it has been more than a year since the last year end close then this closing will span all data since the last year end close.

This procedure freezes the accounting data as described in Section 43.4 on page 199. Additionally it clears out all of the profit and loss accounts by setting the balances to zero and posting their balance to the retained earnings account.

Some businesses prefer to create a retained earnings account for each book year they close. LedgerSMB supports that use-case by allowing the user to select which retained earnings account the balance should be posted to.

In order to run year end closing the user must have the role `yearend.run`.

In order to re-open a year end closing the user must have the role `yearend.reopen`. Typically the role to re-open an accounting period is reserved for upper management as any changes to previous periods may have tax, legal, or other government reporting impacts.

The year procedure is run by filling in the data in the top part of the "Period closing dates" view, then clicking the button `Post Yearend`. For example, see Figure 43.1 on page 199.

Be careful here, because the UI default value is the first G/L account available for this procedure, not necessarily the correct retained earnings account.

Some companies want may to include additional transactions in the year end close. Direct support for this use case isn't currently available. Use a manual G/L transactions to accomplish this.

43.6 Fixed asset accounting

43.7 Reporting

43.7.1 Tax reporting

- 1099 (cash based)
- EU VAT (accrual based)

43.7.2 Tax reporting using tax forms

Collecting taxes in tax forms

Linking companies to tax forms

Running tax form reports

43.7.3 Income statement

43.7.4 Balance sheet

43.7.5 Trial balance

Part VI

General Operation

Chapter 44

User Interface

Description of the general operation of LedgerSMB that appears across multiple views in the application and that are not described elsewhere.

44.1 Reports

At the bottom of most report views there is a '[permalink]'. The idea of a permalink is that you get a link which you can share with your colleagues and when inserted into the browser, returns exactly the same report (or at least a search with exactly the same parameters as you used). To copy a permalink the user can right-click and select "Copy link" from the drop down menu and pass it to a colleague by pasting into an email or other messaging App.

Part VII

Customization

Chapter 45

Overview

45.1 Introduction

Customization is about adding or changing behavior of an application in ways that were not foreseen when written. It differs from configuration, because the latter can be used to select between planned behaviors. Since the functionality or behavior to be added wasn't foreseen, this means that customization implies application code being added or changed. Especially changing existing behavior has proven problematic (in the IT industry at large) in terms of being able to later upgrade the underlying software to newer releases. This problem can be mitigated by creation of specific "extension points": places in the software which are designed to expand or replace existing behaviors.

LedgerSMB has several such "extension points":

- Workflow configuration
- Dependency-injection based configuration:
 - Document formatters
 - Bank statement importers
 - HTTP request handlers/interceptors
 - Outgoing mail transport
- Sales/VAT tax calculation

Each bank has its own format for bank statement exports, making it impossible to develop import functionality that's generically usable. Some default importers come with LedgerSMB - mostly as example code for those developing their own. The dependency injection-based configuration supports adding these user-specific developments without changing any of the files that come in the standard distribution.

Another example is changing "Workflow configuration", by which the life cycle of invoices and GL transactions can be changed. This way, additional steps

can be introduced into the life cycle, or steps can be combined (from a user perspective) by automatically executing steps after another has been triggered manually.

Customization usually means additional or modified Perl code needs to be loaded.

@@@TODO: describe where to store this new or overriding code...

45.2 Workflow configuration

LedgerSMB uses the concept of workflows to manage the document life cycle. An invoice for example may be *saved*, *posted* or *reversed*. These are states in the life cycle of the invoice. Each state may have associated actions. In case of the invoice an example may be to *Post* it when it's *saved* or to *E-mail* it when it's *posted*.

Actions associated with a state may be available or not determined by one or more conditions. Examples are “is the posting date of the transaction in a closed period” and “is the current user allowed to post transactions”.

Workflows are stored in the `./workflows/` directory. Each workflow consists of several files, prefixed with the name of the workflow (e.g. `ar-ap.`):

- `actions.xml` (optional) names the list of available transitions in the workflow naming Perl code to be executed
- `conditions.xml` (optional) names the list of conditions to be used in the workflow naming Perl code to evaluate
- `persisters.xml` (optional) defines the Perl mechanism to load and store workflow instances
- `workflow.xml` (required) defines the life cycle (states, actions and conditions) with the allowed transitions per state (actions).

Customized versions of workflow definition files must be stored in `./customized_workflows/`¹. Files stored in this location will be used to override the ones in the standard location `./workflows/`: the file `./custom_workflows/ar-ap.workflow.xml` will replace the built-in workflow from `./workflows/ar-ap.workflow.xml` used for invoices and AR/AP transactions. No changes should be made directly to the standard files because of the risk that those files will be overwritten on upgrade – losing the changes.

Next to the per-workflow files, there is a generic definition file for actions, conditions and persisters. Elements defined in these files can be used in all workflows; those elements defined in the per-workflow files can only be used in the specific workflow.

¹See Section 17.4.1 on page 96 on how to configure these paths

The engine driving workflow state management is the Workflow² library. See its documentation on MetaCPAN as well as the built-in workflows as examples of how to define one's own.

45.2.1 Workflow observers

Particularly interesting is the concept of observers: this functionality allows the application to be extended based a specific action occurring without changing the life cycle. An example could be to create a PayPal payment request when an invoice is posted: an observer could be “listening” to “AR/AP” workflow events which at some point will flag the state of the invoice becoming `posted`.

Notes on Quote, Order, AR, AP and GL workflow customization

The actions in the workflows `order-quote`, `ar-ap` and `gl` are hard coded³. This means that the list of actions is restricted to those defined in the files `order-quote.actions.xml`, `ar-ap.actions.xml` and `gl.actions.xml`. It's not necessary to use all actions in the workflow, but additional ones cannot be created – contrary to what is in the Workflow documentation.

The `class` attribute for most actions in these workflows is set to the value `LedgerSMB::Workflow::Action::Null`. This means it does nothing. Rather, it doesn't do anything *in addition to* what the action already does in its hard coded implementation. Setting the action's class attribute to some other value allows the developer to add behavior on top of what's hard coded.

45.3 Document formatters

Document formatters transform templates into output documents; e.g. an HTML invoice template can be transformed into an HTML file with the details of the invoice filled out. LedgerSMB comes with a number of built-in formatters. Additional ones could be implemented to transform HTML documents to PDF (replacing the traditional \LaTeX to PDF) or the creation of eInvoices in the format of the local jurisdiction.

The generation of output entails these steps (preceded by the process to find a suitable document formatter):

- Loading the input template from the database
- Preprocessing the input variables using the formatter's `encode` function
- Initializing the template expansion using the formatter's `setup` function
- Expanding the template using `Template::Toolkit`

²<https://metacpan.org/pod/Workflow>

³This is not a permanent situation, but rather a consequence of these workflows being used in old code

- Post-processing the expanded output using the formatter's `postprocess`

A custom formatter needs to implement the protocol as documented at <https://docs.ledgersmb.org/perl-api/1.11.0/LedgerSMB/Template.pm.html#FORMATS>.

45.4 Bank statement importers

LedgerSMB comes with three bank statement importers built-in:

CAMT.053 The ISO-20022 “Cash Management” message 053 (Bank-to-Customer account statement)

OFX A standard to exchange data describing financial transactions

CSV File based using Comma Separated Values (CSV)

The bank statement importer is a Perl class implementing the `LedgerSMB::Reconciliation::For` role; it parses a file with bank transactions, extracting the fields expected by the bank reconciliation procedure:

amount The amount involved in the transaction; negative if the bank reports a credit amount, positive when it's a debit

date The date on which the amount contributed to the bank account balance

source An identifier by which the bank identifies the transaction; to be used for matching with the “Source” field in the bank ledger

type Information clarifying the transaction; e.g. Cash, ACH, etc.

The CSV parser has many options to accommodate the tremendous variance that can be observed in CSV files. When using a custom bank reconciliation procedure *or* when the bank makes a more exotic format available, customization of the bank statement importer may be necessary.

45.5 HTTP request interceptors

@@@TODO: describe how to add `Plack::Middleware` instances in the request processing

45.6 Outgoing mail transport

The library used for sending e-mail (`Email::Sender`) includes a wide variety of transports that can be used to configure the library to (pretend to) send e-mail messages. For a list of available transports, see <https://metacpan.org/dist/Email-Sender>.

Should a different delivery method be required even considering the list of available transports, this can be achieved by implementing a custom `Email::Sender::Transport`.

45.7 Sales/VAT tax calculation

Tax calculations performed for VAT and/or sales taxes have been abstracted into so-called “tax modules”. An example of a custom tax module can be found in the directory `utils/wa-tax-service` in the source repository.

Before tax modules can be used, they need to be registered in the `taxmodule` table.

Important: Please note that there is a tight integration between the database “pointing” to the tax module and the web server which expects to be able to *load* this Perl code to perform the prescribed calculations. If for some reason the application loses the ability to load the Perl module, this will break the ability to create or view invoices.

Chapter 46

Batch data import methods

46.1 Custom bank statement import

46.2 Chart of Accounts import

This function allows bulk import of an entire chart of accounts using a single CSV file.

The first line of the file contains the headers of the columns. The import routine expects the columns as presented in (table name).

accno

Number of the account or header

desc Description for the account or header

charttype

"H" for heading record

"A" for account record

category

"I" for Income

"E" for Expense

"A" for Asset

"L" for Liability

contra

"0" not a contra account

"1" is a contra account

tax

"0" not a tax account

"1" is a tax account.

link A colon (':') separated list of account check-mark values (links) as described in Section 18.3.3 on page 106, or "AR", "AP" or "IC" for the specified summary accounts

heading

“accno” of the heading to group the account (or heading) under

gifi GIFI account number

All lines after the first one are considered to be data lines.

Chapter 47

Add-ons and plug-ins

Chapter 48

Company creation

48.1 Template sets

Part VIII

Workflows

Chapter 49

Overview

Workflows control certain LedgerSMB internal processes and can be created and edited by technical staff using the XML files in the directory `LedgerSMB/workflows`.

@@@TODO Need more info.

Part IX

Appendices

Appendix A

Differences between version 1.2 and 1.3

A.1 Users

The way users are defined and used differs greatly between LedgerSMB 1.3 and older versions. In version 1.3 user access to the database is enforced by the database itself. This means that users logging in to the LedgerSMB web application are in reality logging into the PostgreSQL database. In older versions, the web app would verify the user's credentials (using a common database connection used for all users).

The difference between these approaches is that security is no longer (solely) maintained by the web application - with all inherent risks. Instead, the database now plays an important role as well. The effect is that the LedgerSMB team now leverages the experience of the PostgreSQL community - a highly respected community well known for its security focus - to make sure your data stays secure.

This structure also enables LedgerSMB 1.3 to offer separation of duties and authorizations throughout the application without being required to do a full rewrite of the application.

It's this shift in paradigm that makes it impossible to meaningfully migrate users from older LedgerSMB and SQL-Ledger versions to LedgerSMB 1.3.

Appendix B

Why deleting invoices is not supported

B.1 Invoices are debt claims

B.2 Cost Of Goods Sold become ambiguous

From a mail by Chris Travers on the LedgerSMB mailing list:

Suppose I buy 10 widgets for \$1 each and then 1 more widget for \$10 each. My FIFO cost queue looks like this:

\$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$1 \$10

My inventory account shows \$20 in debits and I have credited my AP account to compensate.

I then sell the 11 parts to 11 different people.

The first 10 invoice show a \$1 credit against inventory and a \$1 debit against COGS

The 11th invoice shows a \$10 credit against inventory and a \$10 credit against COGS

and now inventory is down to 0.

Now the 5th customer invoice turns out to be in error. We never shipped this one. The customer never ordered it. it was a data entry error. Translation, we now have one in stock.

If we void the invoice properly, we will reverse the last sale, and put \$10 back in inventory.

If we delete the invoice, we will just remove the \$1 removed. But we don't really know which one was sold and so we de-allocate the \$10 sale.

So now our books are \$9 off of what they should be. They show a balance of \$1 in inventory, and \$19 in cogs. They should show \$10 in each. The worse is still to come however.

Now we sell the item we had in stock. This brings our (empty!) inventory value to -\$9 and our COGS value to \$29. Our books are still \$9 off and we now have impossible, nonsensical values. Delete and re-enter a few more invoices and you can inflate the COGS as far as you'd like. This doesn't work.

Worse, this can't be fixed. You can't make a deletion behave just like a reversal and still keep your books transparent auditability-wise. Even if it could be fixed mathematically (which it can't), there isn't any agreement as to what the proper behavior should be (except 'don't do that'). So it isn't possible to support the workflow "properly" because "properly" can't be defined.

So unless someone can show that the above issues are incorrect, I don't see how we can support deleting invoices after they are posted to the books.

The alternative is the draft/voucher system which is supported in 1.3 for all non-inventory transactions and will be supported for inventory transactions in 1.4. In this system, in the paper world, the clerk fills out a piece of paper with the information that will be entered as an invoice, and this is eventually gets entered and checked by someone else. Both papers are kept in paper systems for reconciliation purposes but typically we tend to assume they are the same (this may be changing and we may be keeping both copies if they are changed in the future). In this model, the voucher is not an invoice. It is simply a piece of paper that represents what will be on the invoice. It is subject to review, and may ultimately be denied.

So in this system we do **not** calculate extrinsic financial movements for documents until they post. This includes COGS. If a draft invoice or invoice voucher is deleted before it is approved it has none of the problems above. Once approved though, it is a part of the permanent record. This guards against data entry errors because a second person can review the data before it is posted (either in bulk or individually). Additionally this guards against theft by ensuring that a single individual cannot individually enter everything necessary to cover for theft, etc.

Appendix C

Installation

LedgerSMB can be installed on almost any Linux host including Raspberry Pi. The project uses Debian for its docker images and Continuous Integration (CI) testing.

The following installation methods are available:

1. Docker Preview - The recommended way to quickly run and evaluate LedgerSMB. This method is not suitable for internet facing installations.
2. Docker Production - A more secure installation suitable as a base for internet facing use.
3. Native - A more complex installation that requires detailed knowledge of the underlying operation system. The project does NOT recommend this installation method.
4. Docker Development - Used by developers and includes extra libraries and code. Not recommended unless developing code for LSMB.
5. Linux Distribution - Some distributions have old versions of LedgerSMB. With recent LSMB improvements, the LSMB project no longer fits into the distribution's guidelines. The consequence is that distributions are no longer updated or maintained. The project does not recommend using LSMB from any Linux distribution.

C.1 Docker preview

The advantage of using docker preview is that all prerequisites are determined and loaded automatically. This is the quickest way to preview LedgerSMB.

This method should NOT be used to install LSMB in a manner that allows internet wide connections.

On Ubuntu 22.04 use the following commands:

```
# Install docker compose
sudo apt install docker-compose

# Make sure user is in the docker group
sudo usermod -a -G docker $USER

# Get the latest version of LSMB 1.11
wget https://raw.githubusercontent.com/ledgersmb/
    ledgersmb-docker/1.11/docker-compose.yml

# Update the group credentials
exec su -l $USER

# Start the container not using sudo
docker-compose up -d
```

For the authoritative installation source see <https://github.com/ledgersmb/LedgerSMB/blob/master/README.md>

C.2 Docker Production

See <https://github.com/ledgersmb/ledgersmb-docker?tab=readme-ov-file#docker-compose-with-reverse-proxy> for the installation instructions.

C.3 Native

LedgerSMB provides installation tarballs for installing LSMB into the native file system. This installation method requires experience and detailed knowledge of both the Linux operating system and LedgerSMB. Experience has shown that getting prerequisites and security correct is sometimes a significant challenge.

The following commands were tested on a clean, default, server install with no snaps using `ubuntu-22.04.3-live-server-amd64.iso`.

The steps were extracted from the docker install at <https://github.com/ledgersmb/ledgersmb-docker/blob/1.11/Dockerfile>. This docker file should be considered the authoritative source.

Warning

The following commands need to be modified for proper security, which is the responsibility of the installer.

Make sure Ubuntu is up to date:


```
sudo apt update
sudo apt -y upgrade
sudo reboot
```

Install the prerequisites:

```
#!/bin/bash
#
# The following commands show an example of the commands
# that may be used for a native install.
#
# They have a number of shortcomings that an experienced
# Linux administrator should recognize and correct.
#
# For example, PostgreSQL is, by default, installed
# and running as a superuser and should not be.
#

set -e    # stop on error
set -x    # echo commands

sudo apt-get -y install \
    cpanminus \
    make \
    gcc \
    libperl-dev \
    wget ca-certificates \
    gnupg \
    iproute2 \
    libclass-c3-xs-perl \
    texlive-plain-generic \
    texlive-latex-recommended \
    texlive-fonts-recommended \
    texlive-xetex fonts-liberation \
    lsb-release \
    dh-make-perl \
    libmodule-cpanfile-perl \
    git \
    wget

sudo apt-file update

# Another viable location is /usr/local/ledgersmb/
export INSTALL_LOCATION="/srv"
export LSMB_VERSION="1.11.8"
export LSMB_DL_DIR="Releases"
export ARTIFACT_LOCATION="https://download.ledgersmb.org/f/
    $LSMB_DL_DIR/$LSMB_VERSION/ledgersmb-$LSMB_VERSION.tar.gz"

wget --quiet -O /tmp/ledgersmb-$LSMB_VERSION.tar.gz \
    "$ARTIFACT_LOCATION"
sudo tar -xzf /tmp/ledgersmb-$LSMB_VERSION.tar.gz \
    --directory "$INSTALL_LOCATION"
rm -f /tmp/ledgersmb-$LSMB_VERSION.tar.gz
cd ${INSTALL_LOCATION}/ledgersmb
```

```

gather () {
for lib in $(cpanfile-dump --with-all-features --recommends --
no-configure --no-build --no-test)
do
    if dh-make-perl locate "$lib" 2>/dev/null ;
    then
        :
    else
        echo no : $lib ;
    fi ;
done
}

gather | grep -v dh-make-perl | \
    grep -v 'not found' | \
    grep -vi 'is in Perl ' | \
    cut -d' ' -f4 | \
    sort | \
    uniq | \
    sudo tee ${INSTALL_LOCATION}/derived-deps

sudo apt-get -y install $(cat ${INSTALL_LOCATION}/derived-deps)

sudo cpanm --quiet --notest \
    --with-feature=starman \
    --with-feature=latex-pdf-ps \
    --installdeps ${INSTALL_LOCATION}/ledgersmb/

# Postgres
# From https://www.postgresql.org/download/linux/ubuntu/
sudo sh \
    -c 'echo "deb https://apt.postgresql.org/pub/repos/apt \
$(lsb_release -cs)-pgdg main" \
> /etc/apt/sources.list.d/pgdg.list'
wget --quiet -O \
    - https://www.postgresql.org/media/keys/ACCC4CF8.asc | \
    sudo apt-key add -

sudo apt-get -y update

# Warning: Actually using the default PG install is NOT best
# practice.
sudo apt-get -y install postgresql

# Optional clean up
# sudo apt-get purge -y git cpanminus \
#     make gcc libperl-dev
# sudo apt-get autoremove -y
# sudo apt-get clean

```

Once all of the prerequisites have been installed the user can proceed by following the install instructions on the web site. For example, <https://ledgersmb.org/content/installing-ledgersmb-111>, starting at "Configuring the

PostgreSQL server”

C.4 Docker Development

See <https://github.com/ledgersmb/ledgersmb-dev-docker/blob/master/README.md> for the installation instructions.

C.5 Linux Distribution

This method of installation is not recommended. These old distributions only exist to support existing users that have not yet upgraded.

Appendix D

Migration

D.1 Introduction

There are plenty of reasons to want to migrate to LedgerSMB 1.3:

1. Separation of duties
2. Security better integrated into the application
3. Better, more strict data model
4. Some important sources of user error eliminated
5. Better workflows for cash reconciliation
6. @@@ others?

Yet, while item 3 is a good reason to want to switch, it's also a reason why migration from older versions to 1.3 can be harder than earlier migrations: when the data in your older version is not consistent, it won't fit into the new data model and will need to be fixed first.

Especially if your database has a very long line of history, being migrated through lots of SQL-Ledger and LedgerSMB versions, you may want to consider asking for help from a professional party. It could save you a lot of time.

However, don't be discouraged and have a go yourself first. Just be sure to run your upgrade on a backup database: the migration process is non-destructive, but in case accounting data is involved: better safe than sorry!

Also it is worth noting that a number of automatic checks are performed on your data prior to migration, and to the extent possible, you are given an opportunity to fix those issues identified. Because these checks are pre-migration checks, they are written to your old data and will persist after backing out of a migration to 1.3.

D.2 From older LedgerSMB versions

D.3 From SQL-Ledger 2.8

D.4 From older SQL-Ledger versions

D.5 From other accounting packages

D.5.1 Overview

While accounting and ERP solution have wildly differing structures to record their data, this sections uses data with a relatively simple structure as a show case of how this problem may be dealt with.

Note that the encoding you use to transfer to the database depends on the settings used to create the PostgreSQL database with. A migration is a good moment to think about encodings an solve older encoding issues. Now would be a good moment to anticipate the requirement for accented characters and non-western alphabets: set up a UTF-8 encoded database and recode your data accordingly.

D.5.2 Migrating customers

The source system for this section uses a structure where every company has one contact person, one address, one phone number and e-mail.

In order to understand how to migrate this data structure to LedgerSMB, it's important to understand that:

1. The company from the source maps to the *Company* and *Entity* entities
2. The contact person maps to the *Entity Credit Account* entity
3. The address maps to the *Location* entity - and requires a location class: Sales, Billing or Shipping
4. The phone number, fax number and e-mail map to *Contact items*

The reason behind the separation between the *Company* and *Entity* entities is that every customer is an *Entity*, but not all entities are companies, since some entities are *Persons* - natural persons.

@@@ How to

D.5.3 Migrating parts, services, ...

D.5.4 Migrating the balance

The strategy that I used when migrating to LedgerSMB is the following:

- create customers and vendors as needed
- create at least the parts and services for which there are open AR or AP items in the closing balance
- create the open AR/AP items in the closing balance by posting them on the original opening date (this allows you to do your aging management in LSMB from day 1)
- create in addition the parts for which you have stock in the closing balance
- import your stock by posting invoices against the inventory entity
- make sure you “pay” the invoices - e.g. by paying them from equity
- draw up the incomplete balance you have so far
- calculate the delta of the partially imported balance against the closing balance
- import the delta balance on top of what you already had to make a full balance

What I did is post the transaction from the last step on the day before I wanted to start my books; say you want to start your books on 2014-01-01, then you’d post it on 2013-12-31. That way, the opening balance of your books on the starting date is exactly what you had on the closing balance of the books you left behind.

Migrating open AR and AP items

Migrating your ledger

D.6 Migrating between PostgreSQL versions

There are generally 2 ways to upgrade PostgreSQL that apply to normal LSMB installations. Both are described in the current PostgreSQL documentation at <https://www.postgresql.org/docs/current/index.html>.

1. Dump and restore - Described in more detail below. Note that the roles must be restored before database creation and the data restore.

2. Upgrade in place using `pg_upgrade` - When doing an upgrade in place, there are no specific LedgerSMB requirements. Beware, upgrade in place requires both versions of the PostgreSQL to be installed and working. It is therefore more complex.

LedgerSMB versions prior to version 1.9.16 did not support PostgreSQL 14 or higher due to a backward incompatible change in PostgreSQL 14. Best practice in this situation is to update to at least LSMB 1.10. prior to upgrading to any version of PostgreSQL 14 or higher.

The following upgrade procedure uses `lsmb_dbadmin` for the database administrative user.¹ But if the original database installation did not follow the recommended installation practice, then the `postgres` superuser may have to be used. Using the `postgres` superuser is not considered best practice.

The following upgrade procedure should not be used when upgrading a cloud provided PostgreSQL installation. In this case, the cloud provider's instructions have to be consulted to determine the proper upgrade procedure.

The upgrade procedure when using dump and restore with a local LSMB native or docker installation is:

1. Stop users from accessing the current LSMB installation and make sure all users are logged off. The instructions for this step vary depending on how LSMB was installed. Note that access to `setup.pl` will be needed to create backups.
2. Make sure the current LedgerSMB installation is using the latest version. If not, see the Section D.2 on page 238 for instructions on upgrading LSMB.
3. Make a dump of both the roles and data using `setup.pl`.
4. Inspect the backup to make sure it is complete. Ideally, this inspection would include restoring the backup to temporary LedgerSMB installation with the same versions as the existing installation. Then make sure it is complete by logging into the temporary LedgerSMB installation and inspecting reports, accounts, etc. Do not proceed unless you are sure your backups can be restored completely and accurately.
5. Create a new LedgerSMB installation with the new version PostgreSQL. The instructions for a new install are at <https://ledgersmb.org/installation>.
6. The next 3 restore steps, using `psql`, came from <https://ledgersmb.org/faq/how-do-i-restore-my-data>, which these instructions supersede. Other restore tools might work, but they have not been tested.
7. Restore the "roles" backup. The `psql` syntax is:

¹Default LedgerSMB installations do not automatically create an `lsmb_dbadmin` user. This user is created manually during the initial database installation. For an example see, <https://ledgersmb.org/index.php/content/installing-ledgersmb-111>.


```
$ psql -h [database host] -U [database admin user] < [roles
backup file]
```

For example:

```
$ psql -h localhost -U lsmb_dbadmin < lsmb-roles.sqlc
```

8. Create a new database. The database name is usually very similar to the company name. Do not create the database using `setup.pl` as that creates the company structure inside the database, which will interfere with the restore. The `psql` syntax is:

```
$ psql -h [database host] -U [database admin user] -c 'CREATE
DATABASE [new company name]'
```

For example:

```
$ psql -h localhost -U lsmb_dbadmin -c 'CREATE DATABASE
newcompany'
```

9. Restore the "data" backup. The `psql` syntax is:

```
$ psql -h [database host] -U [database admin user] [new
company name] < [company backup file]
```

For example:

```
$ psql -h localhost -U lsmb_dbadmin newcompany < lsmb-db.sqlc
```

10. Read the beginning section of the PostgreSQL release notes for each PostgreSQL version from the old to the new and determine if there are any additional steps that must be performed on the database after the restore. If there are, do them now.
11. Verify all data restored and that LedgerSMB is working correctly.
12. Replace the old LSMB installation with the new installation. The exact steps to accomplish this varies based on how LSMB was originally installed.
13. Allow users to use LSMB.

D.6.1 Notes on migration from PostgreSQL 8.3 (or earlier) to 8.4 - deprecated

The content of this sub-section is deprecated, unedited, and only remains for historical reference purposes.

Performance benefit due to built in support for recursive queries only available after the next `setup.pl` run Also, after next `setup.pl` run, one should uninstall the `tablefunc` extension

In 9.1+ may need to `DROP EXTENSION tablefunc;`.

In 8.4, to 9.0 may need to `uninstall_tablefunc.sql` from the PostgreSQL contrib directory.

LedgerSMB 1.3 uses some extension modules for versions PostgreSQL 8.3 and before for functionality that has been built into PostgreSQL 8.4 and later. To make use of the (faster) built in version of that functionality, the following restore procedure should be used.

1. Migrate the database to the new function as described in section
2. If you're using 9.1 and up, issue the command "CREATE EXTENSION tablefunc FROM UNPACKAGED" from a psql prompt when connected to the company database
3. Run 'setup.pl' from your browser to upgrade the database's routines; this command will install routines optimized for your version of PostgreSQL
4. To clean up functions and procedures in the database which are no longer used you may need to run one of the commands below:

8.4 or 9.0

`psql ... -f uninstall_tablefunc.sql` in a shell

9.1 to 9.5

`DROP EXTENSION tablefunc;` from a psql session connected to the company database

Appendix E

Listing of application roles

Application roles specify the right (privilege) to execute one or more tasks in the application. LedgerSMB enforces these roles by allowing a user to select (list, read) data from or to insert (create), update (edit) or delete (delete) data in the tables holding the data related to the execution of these tasks.

These roles definitions are generated directly from a running database using `gather-db-info.pl`.

Auto generated using LedgerSMB version 1.12.0-dev on March 28, 12:06:14 2024 CDT.

account.all

This role combines all General Ledger (GL) account and GIFI code rights.

account.create

This role allows creation of new GL accounts.

account.delete

This role allows deletion of GL accounts. Please note that there are only very few circumstances where a GL account can be deleted. Instead of deleting the account, the user is advised to mark the account as 'obsolete'.

account.edit

This role allows modification of GL accounts.

account.link_description.create

This role allows creating new use-cases for GL accounts (so called "account link descriptions").

ap.all

This role combines all (batches of) purchase transaction and invoices permissions.

ap_invoice_create

This role allows creation of new purchase invoices (not purchase transactions).

ap_invoice_create_voucher

This role allows creation of batches of new purchase invoices (not purchase transactions).

ap_transaction_all

This role allows creating and viewing purchase transactions and accounts as well as creating attachments.

ap_transaction_create

This role allows creation of purchase transactions (not invoices).

ap_transaction_create_voucher

This role allows creation of batches of new purchase transactions (not invoices).

ap_transaction_list

This role allows viewing of purchase transactions and invoices.

ap_voucher_all

This role allows creation of batches of both purchase transactions and invoices.

ar_all

This role combines all (batches of) sales transaction and invoices permissions.

ar_invoice_create

This role allows creation of new sales invoices (not sales transactions).

ar_invoice_create_voucher

This role allows creation of batches of new sales invoices (not sales transactions).

ar_transaction_all

This role allows creating and viewing sales transactions and accounts as well as creating attachments.

ar_transaction_create

This role allows creation of new sales transactions (not invoices).

ar_transaction_create_voucher

This role allows creation of batches of new sales transactions (not invoices).

ar_transaction_list

This role allows viewing of sales transactions and invoices.

ar_voucher_all

This role allows creation of batches of both sales transactions and invoices.

assembly_stock

This role allows triggering a stocking action on assemblies.

Stocking assemblies means converting labor and parts to stocked assemblies.

assets_administer

This role combines all assets rights.

assets_approve

This role allows approving the output of the depreciation procedure.

assets_depreciate

This role allows running the asset depreciation procedure.

assets_enter

This role allows creation of new assets.

audit_trail_maintenance

This role grants delete access to the audit trail table.

auditor

This role grants read access to the audit trail table.

base_user

Users need to be given this role in order to be granted access to the database schema which holds all LedgerSMB objects.

This role only allows access to menu items Preferences, Logout, and New Window. The user basically cannot do anything without added additional roles.

batch_create

This role allows creation of new batches and vouchers.

batch_list

This role allows listing existing batches.

batch_post

This role allows posting batches of e.g. transactions, payments and invoices.

budget_approve

This role allows searching, viewing and approving of budgets.

budget_enter

This role allows creation and updating of budgets.

budget_obsolete

This role allows searching and viewing budgets as well as marking them obsolete (=no longer applicable).

budget_view

This role allows searching and viewing of budgets.

business_type_all

This role combines the create and edit rights for 'type of business' classes.

business_type_create

This role allows creation of new 'type of business' classes.

business_type_edit

This role allows modification of 'type of business' classes.

business_units_manage

This role allows searching, viewing, creation and editing of business (reporting) classes and their members.

cash_all

This role combines the all reconciliation rights with the rights to enter payments and receipts.

contact_all_rights

This role combines all 'contact_class_*' and 'contact_*' roles and grants all access rights to all contact classes.

contact_class_cold_lead

This role allows access to cold sales lead contact data. Combine with 'contact_read', 'contact_create', 'contact_edit' and/or 'contact_delete' to determine the type of access granted.

contact_class_contact

This role allows access to contact data (e-mail, phone, etc) of all kinds of contacts (customer/vendor/...). Combine with 'contact_read', 'contact_create', 'contact_edit' and/or 'contact_delete' to determine the type of access granted.

contact_class_customer

This role allows access to customer contact data. Combine with 'contact_read', 'contact_create', 'contact_edit' and/or 'contact_delete' to determine the type of access granted.

contact_class_employee

This role allows access to employee contact data. Combine with 'contact_read', 'contact_create', 'contact_edit' and/or 'contact_delete' to determine the type of access granted.

contact_class_hot_lead

This role allows access to hot sales lead contact data. Combine with 'contact_read', 'contact_create', 'contact_edit' and/or 'contact_delete' to determine the type of access granted.

contact_class_lead

This role allows access to sales lead contact data. Combine with 'contact_read', 'contact_create', 'contact_edit' and/or 'contact_delete' to determine the type of access granted.

contact_class_referral

This role allows access to referral contact data. Combine with 'contact_read', 'contact_create', 'contact_edit' and/or 'contact_delete' to determine the type of access granted.

contact_class_robot

This role allows access to robot (automated process, acting on behalf of...) contact data. Combine with 'contact_read', 'contact_create', 'contact_edit' and/or 'contact_delete' to determine the type of access granted.

contact_class_sub_contractor

This role allows access to subcontractor contact data. Combine with 'contact_read', 'contact_create', 'contact_edit' and/or 'contact_delete' to determine the type of access granted.

contact_class_vendor

This role allows access to vendor contact data. Combine with 'contact_read', 'contact_create', 'contact_edit' and/or 'contact_delete' to determine the type of access granted.

contact_create

When paired with one or more 'contact_class.*' role/-s, this role allows creation of new entities, persons and companies (contacts).

Each contact_class.<resource> role, when paired with contact_read, enables this access for the specific <resource>. On it's own, the contact_create-role does not provide any rights.

contact_delete

When paired with one or more 'contact_class.*' role/-s, this role allows removal of existing entities, persons and companies (contacts).

Note that in order to be able to search for contacts to be deleted, the user needs to be assigned the 'contact_read' role.

Each contact_class.<resource> role, when paired with contact_read, enables this access for the specific <resource>. On it's own, the contact_delete-role does not provide any rights.

contact_edit

When paired with one or more 'contact_class.*' role/-s, this role allows editing of existing entities, persons and companies (contacts).

Each contact_class.<resource> role, when paired with contact_read, enables this access for the specific <resource>. On it's own, the contact_edit-role does not provide any rights.

contact_read

When paired with one or more 'contact_class.*' role/-s, this role allows searching and viewing entities, persons and companies (contacts).

Each contact_class.<resource> role, when paired with contact_read, enables this access for the specific <resource>. On it's own, the contact_read-role does not provide any rights.

country_all

This role combines all rights for countries.

country_create

This role allows creation of new countries.

country_edit

This role allows modification of countries.

draft_modify

This role allows modification of existing draft (= saved) transactions.

draft_post

This role allows posting of saved transactions to the ledger.

employees_manage

This role allows creation, updating and searching of employees.

exchangerate_edit

This role allows searching, viewing and editing of currencies, exchange rates and exchange rate types.

file.attach_eca

This role allows attaching files to entity credit accounts (customers/vendors).

file.attach_entity

This role allows attaching files to entities (contacts).

file.attach_order

This role allows attaching files to orders and quotes.

file.attach_part

This role allows attaching files to goods and services.

file.attach_tx

This role allows attaching files to transactions and invoices.

file_read

This role allows reading of files attachments and files uploaded through the system menu.

file.upload

This role allows uploading of files through the system menu.

financial_reports

This role allows running of financial reports: Income Statement, Balance Sheet, Trial Balance and Inventory & COGS.

gifi.create

This role allows creation of new GIFI codes.

gifi.edit

This role allows modification of GIFI codes.

gl_all

This role combines GL transaction and batch creation with GL reporting and year-end processing.

gl_reports

This role allows searching transactions in the general ledger.

gl_transaction_create

This role allows creation of new and updating of saved GL transactions.

gl_voucher_create

This role allows creation of batches of GL transactions.

inventory_adjust

This role allows adjusting inventory by creating inventory adjustment reports.

inventory_all

This role grants all rights to manage warehouse configuration, stock receipt, shipping and transfer.

inventory_approve

This role allows confirmation of inventory adjustments by approval of inventory adjustment reports.

inventory_receive

This role allows receiving of parts into stock.

inventory_reports

This role allows searching for and reading existing inventory adjustment reports.

inventory_ship

This role allows shipping of stocked parts.

inventory_transfer

This role allows moving stock between warehouses.

language_create

This role allows creation of new languages.

language_edit

This role allows modification of languages.

orders_generate

This role combines the rights to generate orders from time cards, purchase orders from sales orders and consolidate (purchase and sales) orders.

orders_manage

This role combines all order generation and consolidation rights.

orders_purchase_consolidate

This role allows generating consolidated purchase orders from multiple outstanding purchase orders.

orders_sales Consolidate

This role allows generating consolidated sales orders from multiple outstanding sales orders.

orders_sales_to_purchase

This role allows generating purchase orders from sales orders.

part_create

This role allows creation of new parts.

So as to let the user of this role see/manage pricing per customer, this role includes the ability to read contacts.

part_delete

This role allows deletion of existing parts.

part_edit

This role allows changing existing parts.

payment_process

This role allows entry of payments to vendors.

pricegroup_create

This role allows creation of new price groups.

pricegroup_edit

This role allows changing existing price groups.

purchase_order_create

This role allows creating purchase orders.

purchase_order_delete

This role allows (searching for and) deleting existing purchase orders.

purchase_order_edit

This role allows (searching for and) modifying existing purchase orders.

purchase_order_list

This role allows searching and viewing sales orders.

receipt_process

This role allows entry of receipts from customers.

reconciliation_all

This role combines creation, updating and approval rights for reconciliation reports.

reconciliation_approve

This role allows approval of reconciliation reports.

reconciliation_enter

This role allows creation and updating of reconciliation reports.

recurring

This role allows access to the Recurring Transactions menu; it does not grant rights to list or create transactions.

rfq_create

This role allows creating (purchase) requests for quotation.

rfq_delete

This role allows (searching for and) deleting existing requests for quotation.

rfq_list

This role allows searching and viewing (purchase) requests for quotation.

sales_order_create

This role allows creating sales orders.

sales_order_delete

This role allows (searching for and) deleting existing sales orders.

sales_order_edit

This role allows (searching for and) modifying existing sales orders.

sales_order_list

This role allows searching and viewing sales orders.

sales_quotation_create

This role allows creating sales quotations.

sales_quotation_delete

This role allows (searching for and) deleting existing sales quotations.

sales_quotation_list

This role allows searching and viewing sales quotations.

sic.all

This role combines all rights for Standardized Industry Codes (SIC).

sic.create

This role allows creation of new Standardized Industry Codes (SIC).

sic.edit

This role allows modification of Standardized Industry Codes (SIC).

system_admin

This role combines the rights to manage settings, GL accounts, types of business, SIC, users and tax forms.

system_settings.change

This role allow changing items in the System > Defaults menu.

system_settings.list

This role allows viewing items in the System > Defaults menu.

tax_form.save

This role allows modification of tax forms.

taxes.set

This role allows changing tax rates on tax accounts.

template_edit

This role allows modification of document (e.g. invoice) templates.

timecard_add

This role allows adding time cards for which it needs read access to customers.

timecard_list

This role allows viewing the list of time cards; for which it needs read access to customers.

timecard_order_generate

This role allows generating orders from time cards.

transaction_template_delete

This role allows deletion of template (i.e. unposted) transactions.

translation_create

This role allows creation of translations for parts, parts groups and reporting units.

users_manage

This role allows addition and removal of users to the current company.

voucher_delete

This role allows deletion of vouchers (i.e. groups of e.g. payments).

warehouse_create

This role allows creation of (configuration of) new warehouses.

warehouse_edit

This role allows updating of (configuration of) existing warehouses.

yearend_reopen

This role allows undoing a prior year-end run by reversing the year-end transaction.

yearend_run

This role allows running the year-end process, i.e. clearing the P&L.

Appendix F

Deprecated Content

F.1 ledgersmb.conf

The use of `ledgersmb.conf` is deprecated as of 1 Jan 2023 in favor of `ledgersmb.yaml` and only remains here for historical reasons.

The environment variable for controlling the configuration is `LSMB_CONFIG_FILE`.

By default `LSMB_CONFIG_FILE` points to `/etc/ledgersmb/ledgersmb.conf` and can be set to an alternate location.

[main] Section

language

Set language for login and admin pages.

date_format

Set the date format for the admin pages. The default is `yyyy-mm-dd`. Unset means detected from the browser)

log_level

Specifies the logging level to be used. This setting is ignored when the `log_config` setting is supplied and indicates an existing file. Available values are `OFF`, `FATAL`, `ERROR`, `WARN`, `INFO`, `DEBUG`, `TRACE`.

log_config

Set the name of the extended logging configuration file. This file uses the `log4j/Log::Log4perl` syntax described at <https://metacpan.org/pod/Log::Log4perl#Configuration-files>

dojo_theme

This is the Dojo theme that is used by default when no other theme has been selected. The default if unset is `claro`. Other values can be `nihilo`, `soria`, and `tundra`.

auth

Indicates which authentication module is to be used; default is DB, referring to LedgerSMB::Auth::DB.

cache.templates

Determines if HTML templates used for the LedgerSMB UI will be stored in precompiled form for improved performance. The value 0 (zero) means no caching; the value 1 means caching in the directory `$(tmpdir)/lsmb_templates`; systems running multiple LedgerSMB instances with customized UIs should use separate values for `tmpdir` for that reason

[environment] Section

Sets shell environment variables when starting up.

PATH

If the server can't find applications, append to the path. For example:

```
PATH=/bin:/usr/bin:/usr/local/bin:/usr/local/pgsql/bin
```

PERL5LIB

On some operating systems like macOS the perl path may need to be set. For example, on macOS using Fink's Perl libs it might be set like:

```
PERL5LIB=/sw/lib/perl5
```

[paths] Section**templates**

Templates base directory. Typically set to `templates`.

images

Images base directory. Typically set to `UI/images`.

localepath

Path to locale files. Defaults to `locale/po`.

templates.cache

Location where compiled templates are stored. When relative, appended to the directory specified by `File::Spec->tmpdir()`.

Defaults to `lsmb_templates`.

workflows

Directory where workflow files are stored. Defaults to `workflows`

custom_workflows

Directory where custom workflow files are stored. Custom workflows are used to override behavior of the default workflows by providing actions, conditions, etc. with the same name and type or by providing workflows of the same type with additional states and actions. Defaults to `custom_workflows`.

[programs] Section

Setup the various helper programs that can be used with LedgerSMB.

[mail] Section**smtphost**

The host name of the smtp server. If provided, then do not use local sendmail. Note that one of sendmail or smtp host has to be provided for email to work.

sendmail

Path the local sendmail executable. If provided then do not use an smtp server. Note that one of sendmail or smtp host has to be provided for email to work.

smtpport

The port number of the smtp server. Note this might vary depending on whether TLS or SSL is used.

smtpuser

The smtp server account name

smtpauthmech

The smtp server authentication method

smtp pass

The smtp server password

backup_email_from

Set to enable e-mail delivery of backups. For example: backup_email_from = backups@lsmb_hosting.com

smtp timeout

The timeout value in seconds.

smtp tls

If unset or 'no' then do not use either TLS or SSL. If 'yes' then use TLS and if 'tls' use SSL for the smtp connection.

smtp sender_hostname

Override the default host name for helo.

[printers] Section

This section contains a list of printers and the commands to be executed in order for the output to be sent to the given printer with the document to be printed fed to the program through standard input.

The example below shows how to send standard input data to a printer called "laser" when selecting the item "Laser" in the LedgerSMB printer selection drop down.

```
Laser = lpr -Plaser
```

Or to an Epson Printer.

```
Epson = lpr -PEpson
```

[database] Section

host Name of the host to connect to. See the documentation of the `-h` command line option at <https://www.postgresql.org/docs/current/static/app-psql.html> for more information (documentation unchanged since before 8.3, so applies to older versions as well)

port Port number to be used to connect to. See the documentation of the `-p` option at the same URL as the previous item

default_db

Database to connect to when the “Company” entry field in the login screen is left blank

db_namespace

The name space the company resides in; expert setting – should not be used (default is “public”)

sslmode

Selects whether to use Secure Sockets Layer (SSL) over TCP connections or not; can be “require”, “allow”, “prefer” or “disable”. Default is “prefer”.

Appendix G

Open source explained

G.1 An open source application

G.2 An open source book

Appendix H

Project history

The project started out as a fork of SQL-Ledger (SL) - the open source ERP system developed by Dieter Simader - somewhere between SQL-Ledger versions 2.6 and 2.8. A fork happens when a group of developers can't - for whatever reason - continue to work as one group on a project. At that time, the project splits into two or more projects and the fork is in effect.

LedgerSMB split off from the SQL-Ledger project (i.e. forked) because there was disagreement between developers about how to go forward both with respect to handling of security vulnerability reports as well as the general state of the code base.

After the fork, between versions 1.0 and 1.2 most energy was spent on making LedgerSMB more secure (i.e. less vulnerable to security attacks). In technical terms, measures were taken to fend off (amongst other things):

- Cross site scripting attacks
- Replay attacks
- SQL injection attacks

Come version 1.3 the development directed toward improvement of the overall quality of the code base as the old SL code was in very poor state: looking very much like web programs as they were written in 1998, the code had grown largely outdated in style and was no longer maintainable by 2007.

The 1.3 effort focused on bringing relief with a new application structure. Modern and important features were realized: separation of duties (for the accounting part of the application) and authorizations to allow distinguishing different roles in a company.

Unfortunately, by the beginning of 2011 the project looked mostly dead from an outside perspective: the team had not brought forward any releases since 2007, there were no signs of development and the mailing lists (a measure of community activity) were completely silent. Subversion Version Control (SVN)

commits were continuing, but were being made by ever fewer committers and contributors.

Fortunately development activity was increasing in the first half year of 2011, leading to the release of version 1.3 by September. Between September and the year end in total 10 small bug fixes were released, showing active commitment of the developers to maintain the application.

New committers showed up, indicating revived community interest. Other signs of increased interest are the higher number of bug reports and the creation of the Linux package for Debian 7, which has been included in Ubuntu 12.04 as of October 2012.

Appendix I

Copyright and license

Copyright (c) 2011, 2012 Erik Hülsmann.

This work is licensed under the Creative Commons Attribution License. To view a copy of this license, visit <https://creativecommons.org/licenses/by/3.0/> or send a letter to Creative Commons, 559 Nathan Abbott Way, Stanford, California 94305, USA.

A summary of the license is given below, followed by the full legal text.

I.1 License summary

You are free:

- * to share -- to copy, distribute and transmit the work
- * to remix -- to adapt the work

Under the following condition:

You must attribute the work in the manner specified by the author or licensor (but in a way that suggests that they endorse you or your use of the work).

With the understanding that:

Waiver -- Any of the above conditions can be waived if you get permission from the copyright holder.

Other rights -- In no way are any of the following rights affected by the license:

- * Your fair dealing or fair use rights, or other applicable copyright exceptions and limitations;
- * The author's moral rights;

- * Rights other persons may have either in the work itself or in how the work is used, such as publicity or privacy rights.

I.2 Legal full text

License

THE WORK (AS DEFINED BELOW) IS PROVIDED UNDER THE TERMS OF THIS CREATIVE COMMONS PUBLIC LICENSE ("CCPL" OR "LICENSE"). THE WORK IS PROTECTED BY COPYRIGHT AND/OR OTHER APPLICABLE LAW. ANY USE OF THE WORK OTHER THAN AS AUTHORIZED UNDER THIS LICENSE OR COPYRIGHT LAW IS PROHIBITED.

BY EXERCISING ANY RIGHTS TO THE WORK PROVIDED HERE, YOU ACCEPT AND AGREE TO BE BOUND BY THE TERMS OF THIS LICENSE. TO THE EXTENT THIS LICENSE MAY BE CONSIDERED TO BE A CONTRACT, THE LICENSOR GRANTS YOU THE RIGHTS CONTAINED HERE IN CONSIDERATION OF YOUR ACCEPTANCE OF SUCH TERMS AND CONDITIONS.

1. Definitions

"Adaptation" means a work based upon the Work, or upon the Work and other pre-existing works, such as a translation, adaptation, derivative work, arrangement of music or other alterations of a literary or artistic work, or phonogram or performance and includes cinematographic adaptations or any other form in which the Work may be recast, transformed, or adapted including in any form recognizably derived from the original, except that a work that constitutes a Collection will not be considered an Adaptation for the purpose of this License. For the avoidance of doubt, where the Work is a musical work, performance or phonogram, the synchronization of the Work in timed-relation with a moving image ("synching") will be considered an Adaptation for the purpose of this License.

"Collection" means a collection of literary or artistic works, such as encyclopedias and anthologies, or performances, phonograms or broadcasts, or other works or subject matter other than works listed in Section 1(f) below, which, by reason of the selection and arrangement of their contents, constitute intellectual creations, in which the Work is included in its entirety in unmodified

form along with one or more other contributions, each constituting separate and independent works in themselves, which together are assembled into a collective whole. A work that constitutes a Collection will not be considered an Adaptation (as defined above) for the purposes of this License.

"Distribute" means to make available to the public the original and copies of the Work or Adaptation, as appropriate, through sale or other transfer of ownership.

"Licensor" means the individual, individuals, entity or entities that offer(s) the Work under the terms of this License.

"Original Author" means, in the case of a literary or artistic work, the individual, individuals, entity or entities who created the Work or if no individual or entity can be identified, the publisher; and in addition (i) in the case of a performance the actors, singers, musicians, dancers, and other persons who act, sing, deliver, declaim, play in, interpret or otherwise perform literary or artistic works or expressions of folklore; (ii) in the case of a phonogram the producer being the person or legal entity who first fixes the sounds of a performance or other sounds; and, (iii) in the case of broadcasts, the organization that transmits the broadcast.

"Work" means the literary and/or artistic work offered under the terms of this License including without limitation any production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression including digital form, such as a book, pamphlet and other writing; a lecture, address, sermon or other work of the same nature; a dramatic or dramatico-musical work; a choreographic work or entertainment in dumb show; a musical composition with or without words; a cinematographic work to which are assimilated works expressed by a process analogous to cinematography; a work of drawing, painting, architecture, sculpture, engraving or lithography; a photographic work to which are assimilated works expressed by a process analogous to photography; a work of applied art; an illustration, map, plan, sketch or three-dimensional work relative to geography, topography, architecture or science; a performance; a broadcast; a phonogram; a compilation of data to the extent it is protected as a copyrightable work; or a work performed by a variety or circus performer to the extent it is not

otherwise considered a literary or artistic work.

"You" means an individual or entity exercising rights under this License who has not previously violated the terms of this License with respect to the Work, or who has received express permission from the Licensor to exercise rights under this License despite a previous violation.

"Publicly Perform" means to perform public recitations of the Work and to communicate to the public those public recitations, by any means or process, including by wire or wireless means or public digital performances; to make available to the public Works in such a way that members of the public may access these Works from a place and at a place individually chosen by them; to perform the Work to the public by any means or process and the communication to the public of the performances of the Work, including by public digital performance; to broadcast and rebroadcast the Work by any means including signs, sounds or images.

"Reproduce" means to make copies of the Work by any means including without limitation by sound or visual recordings and the right of fixation and reproducing fixations of the Work, including storage of a protected performance or phonogram in digital form or other electronic medium.

2. Fair Dealing Rights. Nothing in this License is intended to reduce, limit, or restrict any uses free from copyright or rights arising from limitations or exceptions that are provided for in connection with the copyright protection under copyright law or other applicable laws.

3. License Grant. Subject to the terms and conditions of this License, Licensor hereby grants You a worldwide, royalty-free, non-exclusive, perpetual (for the duration of the applicable copyright) license to exercise the rights in the Work as stated below:

to Reproduce the Work, to incorporate the Work into one or more Collections, and to Reproduce the Work as incorporated in the Collections;
to create and Reproduce Adaptations provided that any such Adaptation, including any translation in any medium, takes reasonable steps to clearly label, demarcate or otherwise identify that changes were made to the original Work. For example, a translation could be marked "The

original work was translated from English to Spanish," or a modification could indicate "The original work has been modified.";

to Distribute and Publicly Perform the Work including as incorporated in Collections; and, to Distribute and Publicly Perform Adaptations.

For the avoidance of doubt:

Non-waivable Compulsory License Schemes. In those jurisdictions in which the right to collect royalties through any statutory or compulsory licensing scheme cannot be waived, the Licensor reserves the exclusive right to collect such royalties for any exercise by You of the rights granted under this License; Waivable Compulsory License Schemes. In those jurisdictions in which the right to collect royalties through any statutory or compulsory licensing scheme can be waived, the Licensor waives the exclusive right to collect such royalties for any exercise by You of the rights granted under this License; and, Voluntary License Schemes. The Licensor waives the right to collect royalties, whether individually or, in the event that the Licensor is a member of a collecting society that administers voluntary licensing schemes, via that society, from any exercise by You of the rights granted under this License. The above rights may be exercised in all media and formats whether now known or hereafter devised. The above rights include the right to make such modifications as are technically necessary to exercise the rights in other media and formats. Subject to Section 8(f), all rights not expressly granted by Licensor are hereby reserved.

4. Restrictions. The license granted in Section 3 above is expressly made subject to and limited by the following restrictions:

You may Distribute or Publicly Perform the Work only under the terms of this License. You must include a copy of, or the Uniform Resource Identifier (URI) for, this License with every copy of the Work You Distribute or Publicly Perform. You may not offer or impose any terms on the Work that restrict the terms of this License or the ability of the recipient of the Work to exercise the rights granted to that recipient under the terms of the License. You may not sublicense the Work. You must keep intact all notices that refer to this License and to the disclaimer of warranties with every copy of the Work You Distribute or Publicly Perform. When You Distribute or

Publicly Perform the Work, You may not impose any effective technological measures on the Work that restrict the ability of a recipient of the Work from You to exercise the rights granted to that recipient under the terms of the License. This Section 4(a) applies to the Work as incorporated in a Collection, but this does not require the Collection apart from the Work itself to be made subject to the terms of this License. If You create a Collection, upon notice from any Licensor You must, to the extent practicable, remove from the Collection any credit as required by Section 4(b), as requested. If You create an Adaptation, upon notice from any Licensor You must, to the extent practicable, remove from the Adaptation any credit as required by Section 4(b), as requested.

If You Distribute, or Publicly Perform the Work or any Adaptations or Collections, You must, unless a request has been made pursuant to Section 4(a), keep intact all copyright notices for the Work and provide, reasonable to the medium or means You are utilizing: (i) the name of the Original Author (or pseudonym, if applicable) if supplied, and/or if the Original Author and/or Licensor designate another party or parties (e.g., a sponsor institute, publishing entity, journal) for attribution ("Attribution Parties") in Licensor's copyright notice, terms of service or by other reasonable means, the name of such party or parties; (ii) the title of the Work if supplied; (iii) to the extent reasonably practicable, the URI, if any, that Licensor specifies to be associated with the Work, unless such URI does not refer to the copyright notice or licensing information for the Work; and (iv), consistent with Section 3(b), in the case of an Adaptation, a credit identifying the use of the Work in the Adaptation (e.g., "French translation of the Work by Original Author," or "Screenplay based on original Work by Original Author"). The credit required by this Section 4 (b) may be implemented in any reasonable manner; provided, however, that in the case of a Adaptation or Collection, at a minimum such credit will appear, if a credit for all contributing authors of the Adaptation or Collection appears, then as part of these credits and in a manner at least as prominent as the credits for the other contributing authors. For the avoidance of doubt, You may only use the credit required by this Section for the purpose of attribution in the manner set out above and, by exercising Your rights under this License, You may not implicitly or explicitly assert or imply any connection with, sponsorship or endorsement by the Original Author, Licensor and/or Attribution Parties, as appropriate, of You or Your use of the Work,

without the separate, express prior written permission of the Original Author, Licensor and/or Attribution Parties.

Except as otherwise agreed in writing by the Licensor or as may be otherwise permitted by applicable law, if You Reproduce, Distribute or Publicly Perform the Work either by itself or as part of any Adaptations or Collections, You must not distort, mutilate, modify or take other derogatory action in relation to the Work which would be prejudicial to the Original Author's honor or reputation. Licensor agrees that in those jurisdictions (e.g. Japan), in which any exercise of the right granted in Section 3(b) of this License (the right to make Adaptations) would be deemed to be a distortion, mutilation, modification or other derogatory action prejudicial to the Original Author's honor and reputation, the Licensor will waive or not assert, as appropriate, this Section, to the fullest extent permitted by the applicable national law, to enable You to reasonably exercise Your right under Section 3(b) of this License (right to make Adaptations) but not otherwise.

5. Representations, Warranties and Disclaimer

UNLESS OTHERWISE MUTUALLY AGREED TO BY THE PARTIES IN WRITING, LICENSOR OFFERS THE WORK AS-IS AND MAKES NO REPRESENTATIONS OR WARRANTIES OF ANY KIND CONCERNING THE WORK, EXPRESS, IMPLIED, STATUTORY OR OTHERWISE, INCLUDING, WITHOUT LIMITATION, WARRANTIES OF TITLE, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, NONINFRINGEMENT, OR THE ABSENCE OF LATENT OR OTHER DEFECTS, ACCURACY, OR THE PRESENCE OF ABSENCE OF ERRORS, WHETHER OR NOT DISCOVERABLE. SOME JURISDICTIONS DO NOT ALLOW THE EXCLUSION OF IMPLIED WARRANTIES, SO SUCH EXCLUSION MAY NOT APPLY TO YOU.

6. Limitation on Liability.

EXCEPT TO THE EXTENT REQUIRED BY APPLICABLE LAW, IN NO EVENT WILL LICENSOR BE LIABLE TO YOU ON ANY LEGAL THEORY FOR ANY SPECIAL, INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR EXEMPLARY DAMAGES ARISING OUT OF THIS LICENSE OR THE USE OF THE WORK, EVEN IF LICENSOR HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

7. Termination

This License and the rights granted hereunder will terminate automatically upon any breach by You of the

terms of this License. Individuals or entities who have received Adaptations or Collections from You under this License, however, will not have their licenses terminated provided such individuals or entities remain in full compliance with those licenses.

Sections 1, 2, 5, 6, 7, and 8 will survive any termination of this License. Subject to the above terms and conditions, the license granted here is perpetual (for the duration of the applicable copyright in the Work). Notwithstanding the above, Licensor reserves the right to release the Work under different license terms or to stop distributing the Work at any time; provided, however that any such election will not serve to withdraw this License (or any other license that has been, or is required to be, granted under the terms of this License), and this License will continue in full force and effect unless terminated as stated above.

8. Miscellaneous

Each time You Distribute or Publicly Perform the Work or a Collection, the Licensor offers to the recipient a license to the Work on the same terms and conditions as the license granted to You under this License. Each time You Distribute or Publicly Perform an Adaptation, Licensor offers to the recipient a license to the original Work on the same terms and conditions as the license granted to You under this License.

If any provision of this License is invalid or unenforceable under applicable law, it shall not affect the validity or enforceability of the remainder of the terms of this License, and without further action by the parties to this agreement, such provision shall be reformed to the minimum extent necessary to make such provision valid and enforceable. No term or provision of this License shall be deemed waived and no breach consented to unless such waiver or consent shall be in writing and signed by the party to be charged with such waiver or consent.

This License constitutes the entire agreement between the parties with respect to the Work licensed here. There are no understandings, agreements or representations with respect to the Work not specified here. Licensor shall not be bound by any additional provisions that may appear in any communication from You. This License may not be modified without the mutual written agreement of the Licensor and You. The rights granted under, and the subject matter referenced, in this License were drafted utilizing the terminology of the Berne Convention for the Protection of Literary and Artistic Works (as amended

on September 28, 1979), the Rome Convention of 1961, the WIPO Copyright Treaty of 1996, the WIPO Performances and Phonograms Treaty of 1996 and the Universal Copyright Convention (as revised on July 24, 1971). These rights and subject matter take effect in the relevant jurisdiction in which the License terms are sought to be enforced according to the corresponding provisions of the implementation of those treaty provisions in the applicable national law. If the standard suite of rights granted under applicable copyright law includes additional rights not granted under this License, such additional rights are deemed to be included in the License; this License is not intended to restrict the license of any rights under applicable law.

Acronyms

- AP** Accounts payable. 24
- API** Application Programmer Interface. 27, 96
- AR** Accounts receivable. 24
- CI** Continuous Integration. 231
- CoA**
Chart of Accounts. 45, 46, 59, 102
- COGS**
cost of goods sold. 26, 36, 37, 101
- CSV**
Comma Separated Values. 212, 215
- ERP** Enterprise Resource Planning. 23
- ERP system**
Enterprise Resource Planning system. 23, 24, 30, 51, 259
- FIFO**
First in, first out. 36, 37, 101
- GL** General Ledger. 24, 34, 243, 249, 251
- IAS** International Accounting Standards. 30
- IFRS**
International Financial Reporting Standards. 30
- LIFO**
Last in, first out. 37
- PSGI**
Perl Web Server Gateway Interface. 26
- REST**
Representational State Transfer. 26

- RFQ** Request for quotation. 61, 65–67, 167
- SL** SQL-Ledger. 26, 259
- SSL** Secure Sockets Layer. 256
- SSN** Social Security Number. 49
- SVN** Subversion Version Control. 259
- VAT** Value Added Tax. 59, 200
- VPS** Virtual Private Server. 25
- XML** Extensible Markup Language. 102
- XSD** XML Schema Definition. 102

Definition of terms

accounting year

An accounting year, which may also be called fiscal year, financial year or budget year is a twelve month period used for annual financial reporting. An accounting year may be the same as a calendar year, but most jurisdictions allow the accounting year to be defined differently from the calendar year. 199

accrual basis

Income is deemed earned when the customer invoice is prepared and sent, and the expenses are deemed incurred when the purchase order is prepared and sent. 35

add-on

Extension to the base LedgerSMB system to add new functionality. 24, 138

cash basis

Income is deemed earned when the customer pays it, and the expenses are deemed incurred when the business pays them. 35

company

A company is a contact initially setup as a company and usually has further configuration as a vendor or customer. 163

contact

A contact is primarily a company or person. The contact can be further identified as employee, vendor, customer, contact, lead, referral, hot lead, cold lead, sub-contractor, etc. The contact's setup determines how it is used in LedgerSMB. 163

contra

A contra account is used in a general ledger to reduce the value of a related account when the two are netted together. A contra account's natural balance is the opposite of the associated account. If a debit is the natural balance recorded in the related account, the contra account records a credit. 106, 215

counterparty

A legal entity, unincorporated entity, or collection of entities to which an exposure of financial risk may exist. In LSMB, a counterparty, is the

same as an entity, and can be either a company entity (suppliers, vendors, customers), or a person entity (including an employee). 71–74

credit account

The link between contacts and the accounting system. Credit accounts can be setup to identify contacts as vendors, customers, or both. When setup as both there may be different identifying numbers for the customer and vendor. The term “credit account” is a generalization of the customer and vendor accounts. 163

customer

Is a contact initially setup as a company or person and further configured with at least one customer credit account. 105, 106, 143, 144, 147, 148, 163–166, 178–181, 189, 190, 193, 195, 196

entity

A legal entity, unincorporated entity, or collection of entities to which an exposure of financial risk may exist. In LSMB, an entity, is the same as a counterparty, and can be either a company entity (suppliers, vendors, customers) or a person entity (including an employee). 71

GIFI

Stands for Generalized Index for Financial Information, a system used by the Canada Revenue Agency for filing corporate tax returns (see <http://www.cra-arc.gc.ca/tx/bsnss/tpcs/crprtns/rtrn/wht/gifi-ogrf/menu-eng.html>). 141, 216

ISO-20022

ISO 20022 is a multi part International Standard prepared by ISO Technical Committee TC68 Financial Services. It describes a common platform for the development of messages relating to the financial services industry¹. 212

OFX

Open Financial Exchange (OFX) is a data-stream format for exchanging financial information that evolved from Microsoft’s Open Financial Connectivity (OFC) and Intuit’s Open Exchange file formats². 212

old code

Stands for the code inherited from SQL Ledger at the time of the fork. This code stands to be replaced by “Modern Perl”. 211

permalink

A permalink is a link which you can share with your colleagues and when inserted into the browser, returns exactly the same report (or at least a search with exactly the same parameters as you used). To access the link the user can use the browsers “Copy link” function to copy the link and pass it to a colleague. 205

¹From <https://iso20022.org/>

²From https://en.wikipedia.org/wiki/Open_Financial_Exchange

PL/SQL

Procedural Language for SQL, a programming language from Oracle for building database functionality. LedgerSMB uses a variant supported by PostgreSQL called PL/pgSQL. 26

Single Page Application

Single Page (web) Applications are a type of web applications; they employ JavaScript and HTML5 techniques to retrieve data, code and layout fragments from the server as the UI needs them. They are called “single page” because they use JavaScript to update the current page instead of loading a completely new page. 26

vendor

Is a contact initially setup as a company or person and further configured with at least one vendor credit account. 163, 164, 166

Index

- accounting year, 199
- accrual basis, 35
- add-on, 24, 138
- address, 74
- apache, 95
- API, 96
- application roles, 101

- backup, 43, 121, 153, 155
- bank statements, 209

- cash basis, 35
- Chart of Accounts, 102
- chart of accounts, 45, 46
- Chart of Accounts Import, 109
- Chart of Accounts predefined, 102
- closing, 199
- CoA, 102
- CoA XSD, 102
- COGS, 26, 101
- company, 71, 163
- configuration, 93, 209
- contact, 163
- contra, 106, 215
- counterparty, 71
- createuser, 44
- credit account, 73, 74, 163
- csv, 212
- customer, 63, 66, 71, 163, 164
- customization, 209

- database load path, 98
- database restore, 240
- discount, 147
- dump, 239

- eInvoice, 211
- email, 56, 97, 113, 178
- entity, 71
- extension points, 209

- faq database restore, 240

- FIFO, 101
- foreign currency, 199
- foreign exchange, 109

- General Ledger, 243, 249, 251
- gifi, 141
- GL, 243, 249, 251

- HTML path, 98

- import Chart of Accounts, 109
- install development, 231
- install distribution, 231
- install docker preview, 231
- install docker production, 231
- install native, 231
- installation, 240
- inventory, 101
- invoice, 101, 178
- ISO20022, 212

- ledgersmb-admin, 43
- ledgersmb.conf, 96, 253
- ledgersmb.yaml, 96, 253
- locale path, 98
- LSMB_CONFIG_FILE, 253
- lsmb_dbadmin, 240

- mail, 97

- OFX, 212
- old code, 211
- over payment, 194, 195

- part group, 63, 140
- part hierarchy, 140
- password, 48, 131, 133–135
- password duration, 113
- password expiration, 113
- period closing, 199
- permalink, 205
- person, 71

- pg_hba.conf, 95
- pg_upgrade, 240
- picking, 101
- PL/SQL, 26
- Postgres, 95
- Postgres Security, 95
- PostgreSQL upgrade, 239
- preferences, 134
- price group, 148
- price matrix, 147, 148
- printer configuration, 99
- printing, 99
- psql, 44

- reconciliation, 106
- release number, 96
- REST, 26
- restore, 153, 239
- role account.all, 243
- role account.create, 243
- role account.delete, 243
- role account.edit, 243
- role account.link.description.create, 243
- role ap.all, 243
- role ap.invoice.create, 244
- role ap.invoice.create.voucher, 244
- role ap.transaction.all, 244
- role ap.transaction.create, 244
- role ap.transaction.create.voucher, 244
- role ap.transaction.list, 244
- role ap.voucher.all, 244
- role ar.all, 244
- role ar.invoice.create, 244
- role ar.invoice.create.voucher, 244
- role ar.transaction.all, 244
- role ar.transaction.create, 244
- role ar.transaction.create.voucher, 244
- role ar.transaction.list, 244
- role ar.voucher.all, 244
- role assembly.stock, 245
- role assets.administer, 245
- role assets.approve, 245
- role assets.depreciate, 245
- role assets.enter, 245
- role audit.trail.maintenance, 245
- role auditor, 245
- role base.user, 245
- role batch.create, 245
- role batch.list, 245
- role batch.post, 245
- role budget.approve, 245
- role budget.enter, 245
- role budget.obsolete, 245
- role budget.view, 245
- role business.type.all, 246
- role business.type.create, 246
- role business.type.edit, 246
- role business.units.manage, 246
- role cash.all, 246
- role contact.all.rights, 246
- role contact.class.cold.lead, 246
- role contact.class.contact, 246
- role contact.class.customer, 246
- role contact.class.employee, 246
- role contact.class.hot.lead, 246
- role contact.class.lead, 246
- role contact.class.referral, 247
- role contact.class.robot, 247
- role contact.class.sub.contractor, 247
- role contact.class.vendor, 247
- role contact.create, 247
- role contact.delete, 247
- role contact.edit, 247
- role contact.read, 247
- role country.all, 248
- role country.create, 248
- role country.edit, 248
- role draft.modify, 248
- role draft.post, 248
- role employees.manage, 248
- role exchangerate.edit, 248
- role file.attach.eca, 248
- role file.attach.entity, 248
- role file.attach.order, 248
- role file.attach.part, 248
- role file.attach.tx, 248
- role file.read, 248
- role file.upload, 248
- role financial.reports, 248
- role gifi.create, 248
- role gifi.edit, 248
- role gl.all, 249
- role gl.reports, 249
- role gl.transaction.create, 249
- role gl.voucher.create, 249
- role inventory.adjust, 249
- role inventory.all, 249
- role inventory.approve, 249
- role inventory.receive, 249
- role inventory.reports, 249

- role inventory_ship, 249
- role inventory_transfer, 249
- role language_create, 249
- role language_edit, 249
- role orders_generate, 249
- role orders_manage, 249
- role orders_purchase Consolidate, 249
- role orders_sales Consolidate, 250
- role orders_sales_to_purchase, 250
- role part_create, 250
- role part_delete, 250
- role part_edit, 250
- role payment_process, 250
- role pricegroup_create, 250
- role pricegroup_edit, 250
- role purchase_order_create, 250
- role purchase_order_delete, 250
- role purchase_order_edit, 250
- role purchase_order_list, 250
- role receipt_process, 250
- role reconciliation_all, 250
- role reconciliation_approve, 250
- role reconciliation_enter, 250
- role recurring, 250
- role rfq_create, 251
- role rfq_delete, 251
- role rfq_list, 251
- role sales_order_create, 251
- role sales_order_delete, 251
- role sales_order_edit, 251
- role sales_order_list, 251
- role sales_quotation_create, 251
- role sales_quotation_delete, 251
- role sales_quotation_list, 251
- role sic_all, 251
- role sic_create, 251
- role sic_edit, 251
- role system_admin, 251
- role system_settings_change, 251
- role system_settings_list, 251
- role tax_form_save, 251
- role taxes_set, 251
- role template_edit, 252
- role timecard_add, 252
- role timecard_list, 252
- role timecard_order_generate, 252
- role transaction_template_delete, 252
- role translation_create, 252
- role users_manage, 252
- role voucher_delete, 252
- role warehouse_create, 252
- role warehouse_edit, 252
- role yearend_reopen, 252
- role yearend_run, 252
- roles, 243
- sendmail, 97
- separation of duties, 101, 111
- sequence numbers, 113
- setup.pl, 43
- shipping, 101
- SMTP, 97
- smtp, 255
- SPA, 26
- SQL schema path, 98
- tax, 106
- template cache path, 98
- template path, 98
- templates, 46, 219
- transaction reversal, 199
- user creation, 47
- vendor, 163, 164
- version number, 96
- workflow, 223
- workflow configuration, 209
- workflow observers, 211
- workflow path, 99
- workflows, 101, 210
- XSD, 102
- year end, 199
- yearend_reopen, 200
- yearend_run, 199, 200