ADempiere ERP & CRM

Information Booklet

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1.1 Origin of the "ERP" System

Wikipedia tells us that "ERP systems initially focused on automating back office functions that did not directly affect customers and the general public. Front office functions such as customer relationship management (CRM) dealt directly with customers, or e–business systems such as e–commerce, e–government, e–telecom, and e–finance, or supplier relationship management (SRM) became integrated later, when the Internet simplified communicating with external parties."

"ERP II" was coined in the early 2000s. It describes web–based software that allows both employees and partners (such as suppliers and customers) real–time access to the systems. The role of ERP II expands from the resource optimization and transaction processing of traditional ERP to leveraging the information involving those resources in the enterprise's efforts to collaborate with other enterprises, not just to conduct e-commerce buying and selling. ERP II is more flexible than the first generation ERP. Rather than confine ERP system capabilities within the organization, it goes beyond the corporate walls to interact with other systems. Enterprise application suite is an alternate name for such systems."

The "ERP II" description describes the purpose and functions of the Adempiere ERP & CRM system very well. It is an integrated system that manages all of an organisations internal and external processes including its accounting requirements in a single integrated application.

1.2 ADempiere ERP & CRM

ADempiere ERP & CRM is a sophisticated open source business solution that provides an industrial strength alternative to proprietary products. Many ERP solutions available in the market today provide similar functionality and many organisations only evaluate solutions on the basis of their functional capabilities at a particular point in time. This approach will lead to different results when two products are evaluated over a period of time because of the leap frogging of one product over another as new releases are brought to market and should be used with caution.

The life span of an ERP solution is often ten or more years and during this time technology and business requirements will change. While the functional capability of a product is important, it is equally important to take into consideration the technology on which the product is based and its ability to be modified and enhanced to meet the changing needs of an organisation as its business needs change. Furthermore it is

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critical to make sure that essential changes do not jeopardise the ability to migrate to subsequent releases of the product whilst preserving the integrity of the business specific changes.

Whilst ADempiere is functionally rich, it is its ability to incorporate business specific changes and preserve those changes into future releases of the software that demonstrates its real power.

1.3 ADempiere's Origins

ADempiere is based on the Compiere ERP&CRM project originally created by Jorg Janke and Kathy Pink and contributed to the community under the General Public License (GPLv2).   The far-sightedness of the original developer's has allowed the development over time of a very feature-rich ERP and CRM system which is robust and easily extendible. ADempiere was created on September 2006 based on the original Compiere code base.

Since that time ADempiere has been extended and changed greatly by contributions made by many organisations and people with an interest in the system.

1.4 ADempiere's Strengths

1.4.1 Flexibility

ADempiere adopts open standards which allows:

- standardisation, stability and interoperability of systems
- clear, public and viewable descriptions of data and behaviour
- disparate software to act in complementary ways
- Hardware and operating system independence

1.4.2 Long-term viability

ADempiere shields itself from obsolescence by

- complying with industry standards and utilising toolsets which support these standards thus enabling ADempiere to change the underlying building blocks
- ensuring availability of a large developer support base, knowledgeable in the tools used
- providing source code availability allowing support for the long term
- being highly scalable to meet organic or explosive growth through acquisition
- not being subject to the financial success or survival of any specific organisation.

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Buyers attracted to the idea of buying a proprietary product for its long term reliability and because it is "safer" may be interested to review the blog at http://www2.erpgraveyard.com/tombs.html which shows what has happened to so many ERP systems over time and how they have been taken over and then killed by another industry player.

1.4.3   Lower Total Cost of Ownership

● No software licence fees (subject to database choice)

● No requirement to pay for annual upgrades (typically the major source of software suppliers' ongoing revenue streams)

● Lower costs associated with supplier contract management

● Reduced costs of change management

1.5   The Strengths of Open Source

The following outlines the rewards that can be gained from the introduction of an open source solution such as ADempiere.

1.5.1   Reduces the reliance on a single product supplier

● Minimises proprietary technology lock-in

● Eliminates adherence to supplier biased licensing

● Eliminates requirements to manage and pay for 'escrow' arrangements (if available) from a vendor of proprietary software.

1.5.2   Self Reliance

● Flexible development process with increased focus on the specific needs of the business

● Greater degree of participation and understanding between the supplier and the ultimate user

● Technological self-reliance

● Greater responsiveness to address **local** needs and business opportunities as they are identified

● Development priorities are those of the User NOT the Vendor.

1.5.3   Broad range of support options

● Commercial support from many organisations such as ADAXA

● Free support is available from a number of forums on Sourceforge and on the ADempiere website and wiki. see http://www.adempiere.org and http://www.adempiere.com/index.php/ADempiere.

● The support experience is frequently reported as more responsive than with proprietary applications

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1.5.4 Technically superior

OSS products are more aligned with open standards than proprietary products leading to a greater degree of inter-operability.

1.5.5 Integration with Other Software Systems

Many organisations acquire pieces of software to meet particular needs only to find that there is no method to enable the software systems to share vital information. The separate 'stovepipes' of information result in duplicated effort, data and errors. The same issues can exist with open source software but at least with open source software you can overcome these problems because you have access to the source code of each product. Some proprietary software will also provide APIs designed to allow integration with other applications but in many cases the particular functionality you need does not exist.

ADAXA has addressed this need by creating and publishing the code necessary to enable a selection of applications to integrate directly with ADempiere. Details of this integration are outlined in a later section of this booklet.

1.6 ADempiere Support

An open source solution is almost always supplied at a lower total lifetime cost than a similar proprietary solution however it is often perceived to be provided with a lower level of support and at a higher level of risk than a proprietary solution. This is typically not the case.

The level of support provided by an organisation such as ADAXA can be significantly higher than that provided by a reseller distributing products from the developers of proprietary software applications. The primary reason is that the source code is available and can be modified to resolve the problem locally. In the case of proprietary products the source code is typically not available to the support organisation and they are dependent upon their principal to provide a correction. This is often done in a subsequent release some six to twelve months later.

In addition to the question of support, most organisations like to feel that they can obtain "guarantees" that the software purchased is free from major defect, or if a defect is found it will be quickly fixed. Recent history and common experience is that purchasing software from a major vendor is no guarantee of freedom from errors. Arguably, most versions of UNIX, including Linux, are far less likely to crash at random than Windows, yet for many IT procurers Windows is a "safer bet". The reality is that in open source solutions, the known error lists and the source code are available to enable the support organisation to correct any error that might arise in a timeframe to match the priority of the error. This is usually not the case with proprietary software. Typically

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the error lists are not published and the source code is not available to the organisations who distribute and support the software.

Organisations such as ADAXA have the expertise and the tools available to them to reduce the risk to deploying organisations to at least a comparable and probably lower level than those of proprietary systems.

1.7 Total Cost

Since there can only be a single system selected for a particular implementation it can be quite difficult to do an accurate cost comparison between deploying ADempiere and proprietary competitors. One customer who went through the full RFI process and included all the costs over 10 year reported to their board that relative cost of options reviewed were

- Microsoft DynamicsAX and SAP BusinessOne: more than twice the Adempiere cost,
- Pronto: more than three times the Adempiere cost,
- SAP MySAP: more than five times the Adempiere cost.

No doubt an analysis in a different project and with different implementers would result in a different set of numbers however it is interesting to note that Licence Fees represented nearly 50% of the total external costs over the 10 year period for the two next cheapest alternative to Adempiere. If the analysis had excluded the customer's own project costs then the licence fee component was around 60% of the 10 year cost.

1.8 ADempiere – Hardware & Infrastructure Requirements

1.8.1 Hardware and network infrastructure

ADempiere is able to operate on a large selection of hardware and operating systems, both in-house and in the Cloud. This flexibility enables a user to choose the hardware and operating system platform that meets their individual requirements.

1.8.2 Operating System software

As with hardware, ADempiere will run on a range of operating systems including Unix, Windows, Linux and Mac.

1.8.3 Application servers

Adempiere, by default, utilises the JBoss application server for which no fees are applicable. Some users have also deployed ADempiere on IBM Websphere and the Sun equivalent.

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1.8.4 Licence Costs

1.8.4.1 Software Licences

- **Application Software:** There are NO licence fees for the use of the ADempiere application.

- **Layered products, middleware products**: There are no layered product, middleware licences or CALs required to run ADempiere. The products utilised by ADempiere are industry standard open products which are free of licence fees.

- **Database licences:** ADempiere supports (at April 2013) the use of Postgres, Mysql or Oracle. Postgres and Mysql are completely free of license fees. Oracle license fees for typical ADempiere usage are either free or very low. New sites frequently have databases well under 11gb size and can therefore operate on the free Oracle XE version. Sites with larger databases can typically operate an "Oracle Standard Edition One".

1.8.4.2 Recurring Expenses

- **Hardware Support:** Costs will be dependent on the user's choice of hardware however the opportunity to deploy the ADempiere application in the Cloud or on "white box" commodity hardware provides an opportunity to constrain hardware maintenance costs.

- **Application Software maintenance (upgrades):** The ADempiere user can download for free all changes and upgrades to ADempiere from the community website. Database migration scripts are also provided to assist with version migration. ADempiere provides a mechanism for protecting your modifications (provided, naturally, that these modifications are not in an area that was changed in the upgrade).

- **Application Software support:** Application support can be purchased from ADempiere support organisations such as ADAXA or performed by the user's own staff who will most likely utilise the ADempiere support forums. ADAXA provides a range of support services for clients to enable them to opt for as much or as little external support as they will require. ADAXA typically bills for services provided on a time-used basis.

- **Training and Support:** Training can be provided by ADAXA either in pre-arranged formal training courses or at the ADempiere user's premises with courses tailored to the user's specific requirements.   Where an ADempiere user has reasonable IT and application support capabilities, a 'train-the-trainer' approach is normally applied which assists in containing costs. ERP systems like ADempiere typically provide many ways to perform the tasks encountered in an organisation. This normally requires functionality training courses to be designed to cover only those processes being utiliised.

- **Enhancements and modifications:** ADempiere is designed to simplify enhancements and modifications being performed. The Active Data Dictionary enables modifications to be performed by persons without coding skills meaning that many enhancements, such as adding new columns of data to existing tables, or adding new tables and windows, can be performed by the user's staff. Additionally enhancements and modifications to ADempiere can be performed by ADAXA or others on a fee for service basis.

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1.9 Licence Terms

ADempiere, in common with much open source software, is licensed under the terms of the GNU Public Li-cence. This licence requires that modifications made to the code be provided to the recipient if a copy is "dis-tributed" (as defined in GPL2). There is no obligation to publish any changes or improvements you make un-less you provide a copy to another party; then you must provide the code changes and you can not control what that party does with the code.

The ADempiere licence terms are detailed at http://www.gnu.org/licenses/gpl-2.0.txt

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ADempiere provides fully integrated and easy to use first tier ERP and CRM functionality for mid-market enterprises. Unlike traditional systems it is organised to map onto the typical business processes as shown below. It is provided as a complete, integrated unitary system rather than a series of loosely coupled modules with data transfers between them. This integration applies to the Customer Relationship Management, the web store data as well as the traditional ERP information .

2.1 Why is ADempiere organised to reflect Business Processes?

Business processes rather than traditional departments drive ADempiere's design and in today's world, especially in mid-market enterprises, employees often perform entire business processes or related processes. The chart below is a mapping of the ADempiere processes to the modules often found in more traditional proprietary applications.

Traditional Module	Quote to Cash	Requisition to Pay	Customer Management	Partner Management	Supply Chain	Performance Analysis
General Ledger						✓
Accounts Payables		✓			✓	✓
Accounts Receivables	✓		✓			✓
Purchase Order		✓	✓		✓	✓
Sales Order	✓		✓		✓	✓
Inventory Management	✓	✓	✓		✓	✓
Fixed Assets						✓
Customer Relationship Management	✓				✓	

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2.2 Terminology

In this document certain words are used which have particular meanings within the context of the ADempiere application. They are described below.

- "**Client**" is an entity, most likely a company or equivalent that is using the system. It is a Client in the sense that the ADempiere system is able to provide services to multiple entities and each one thus becomes a client of the ADempiere system. Another word for the same concept is "Tenant".
- "**Organisation**" is a department or division of an entity that is a Client of the ADempiere system. An organisation may also be a legal entity such as a subsidiary company. ADempiere optionally enforces 'loan account' accounting on all transactions that cross Organisation boundaries.
- "**Business Partner**" is an entity with whom the organisation transacts business. It could be a customer, supplier or an employee.
- "**Document**" is a type of transaction typically initiated by a document such as a sales invoice, a material receipt, a shipping document a payment to a supplier or a receipt from a customer. For each type of document the user is able to define the accounting consequence caused by the processing of such a document.

2.3 Quote to Cash

Quote to Cash covers the business processes used for creating quotations for prospects or customers, sales order management, invoicing and cash receipting. The functionality is tightly integrated with Supply Chain Management and Customer Relationship Management components of ADempiere. This functionality is typically found in modules entitled sales order entry and accounts receivable.

2.4 Requisition to Payment

Requisition to Payment covers the business process used for creating purchase orders, processing invoices received from vendors and generating payments. The functionality is tightly integrated with Supply Chain Management. This functionality is typically found in modules entitled purchasing and accounts payable.

2.5 Open Item Management

Open Item Management automates the processes associated with the entry and allocation of cash received from customers and payments made to creditors. Open Item Management also provides for the reconciliation of bank statements and cash books. [ADAXA provides an Adempiere add-on to provide the file format required by Australian Banks].

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2.6 Customer Relations Management

Customer Relations Management is an integrated module providing a logical view of all customer and pro-spect related activities. There are (in contrast to traditional CRM systems) no batch or synchronisation processes with the back-office functionality. Originally the Adempiere CRM functions were focussed on dealing with incoming communications however Adaxa has extended the functions to manage Leads, Opportunities and Campaigns.

2.7 Partner Relations Management

Partner Relations Management links different clients to each other allowing them to manage lead distribution, service requests, collateral distribution and marketing expenses. It facilitates the provision of shared (centralised) services by one organisational entity to other organisational entities. This functionality enables organisations which manage a number of wholly or partly owned entities (such as a franchise operation) to provide centralised services to the remote operations.

2.8 Supply Chain Management

Supply Chain Management covers all material management activities including inventory receipts, ship-ments, movements and stock take count management and processing.

2.9 Performance Analysis

Performance Analysis covers the costing and accounting dimension of the application. This functionality is typically found in Reporting and General Ledger modules as well as in those modules that generate accounting entries.

2.10 Web Store and Business Partner Self Service

The ADempiere **Web Store** allows an organisation to maintain and operate a web presence. The information made available in the web store is shared with the standard application. No synchronisation or additional integration is required. The web store components can be customised to the look-and-feel required to match an existing web site and in addition to web store capability also provide self service functionality to enable Business Partners to view their transactions online with an appropriate level of security.

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2.11 Manufacturing with MRP and MRP2

ADempiere supports manufacturing in both a simple 'Manufacturing Light' mode and also optionally provides full MRP2 manufacturing capability.

2.12 Fixed Assets

The ADempiere **Fixed Asset** module provides the usual functionality expected from a fixed assets module in-cluding depreciation calculation and posting, integration with purchase invoices, disposals etc.

2.13 HR and Payroll

While ADempiere includes relatively recently produced **HR and Payroll** functionality ADAXA does not recom-mend its use in Australia. This is primarily because there has not been the customer demand to justify modific-ation to meet the Australian legal requirements.

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3 Quote to Cash

'Quote to Cash' covers the business processes required for the creation of a quotation for a prospect or customer, sales order management, invoicing and the receipt of cash. The functionality is tightly integrated with Supply Chain Management and Customer Relationship Management. In traditional systems, this functionality is likely to be found in modules entitled sales order processing and accounts receivables.

A schematic showing the process flow from the entry of a Quotation to the receipt of cash is shown below
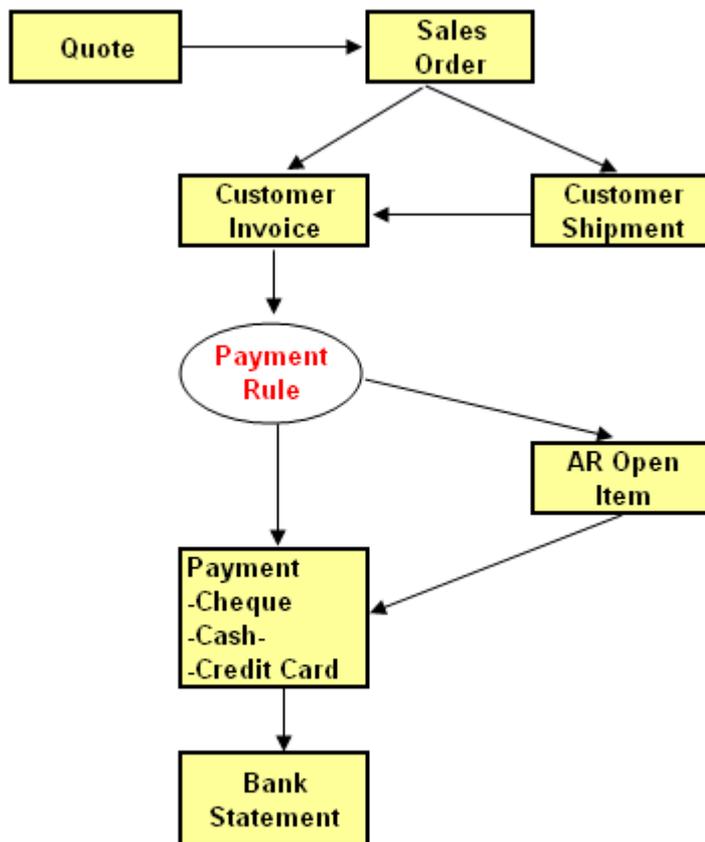
Quotation to Cash Process

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3.1 Quotations

ADempiere provides for the creation and printing of customer quotations based on general or customer specific price lists. Quotations can be made "binding", in which case they reserve inventory. Quotations can be modified at any time and when appropriate automatically converted to a Sales Order without additional data entry. Quotations can either use the standard sales order number sequences or be completely separated and forced to use their own sequences in which case additional process can be added also.

3.2 Sales Orders

A Sales Order is the "fulfilment control document" and from a Sales Order, shipment and invoicing documentation can be generated automatically. In addition it is possible to automatically raise Vendor Purchase Orders for the items specified on the Sales Order and drop-shipped to the customer.

Different types of sales orders cause different business process behaviour. For example, a "Prepaid Order" will not allow shipments to be generated until payment occurs. A "Point of Sale" order assumes the customer is at the counter with the goods in hand and generates all transactions including stock decrement, invoicing and payment through the entry of a single document. A "Standard Order" by comparison, will check availability before accepting the order then queue the order for fulfilment by the warehouse and then generate an invoice in the next invoice run or otherwise in accordance with the invoice rules for that customer.

3.3 Shipments

Based upon the details captured on the Sales Order, one or more shipments can be generated immediately or automatically when inventory subsequently becomes available. ADempiere automatically backorders unavailable items. ADempiere can be configured to allow shipments to be effected from the shipment documentation or alternatively provide for a more disciplined warehouse approach by requiring explicit confirmation of picking and/or shipment prior to the generation of invoice documentation with barcode confirmation of picked products and quantities. Confirmations can be used to manage movements of inventory from, say, a receiving area to 'put away' areas from which it then becomes available for further processing.

3.4 Customer Invoices

Invoices are generated according to the arrangements in place with the customer. Invoices can be generated

- immediately the order is received
- immediately after each shipment

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- when the order is completely shipped, or
- based on a pre-defined Invoice Schedule specific to the customer

For example, an invoice schedule could be established to arrange for the creation of a summary invoice includ-ing all shipments to the customer over the previous day, week or month.

3.5 Receipts

When entering a Sales Order or Invoice, the payment rules allow flexibility in the automatic generation of re-ceipts:

- For cash transactions a Cashbook entry is automatically generated
- For credit card, cheque and direct debit transactions a payment is created against the appropriate bank account. ADempiere supports merchant payment processors via PayPal PayFloPro and eWay (other payment processors can easily be added).
- Open Items are settled by entering Payments (e.g. receiving a cheque or creating a direct debit), creating a Cash Book entry (e.g. open invoice paid by petty cash later) or during the process of reconciling Bank Statements (e.g. bank transfers).

3.6 Returns from Customers

The Customer RMA functionality largely mirrors the Vendor RMA functionality described in the next section.

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'Requisition to Payment' covers the business processes required for the creation of requisitions, purchase or-ders, receipt of vendor invoices and payment processing. The functionality is tightly integrated with Supply Chain Management. In traditional systems this functionality is typically found in modules entitled purchasing and accounts payables.

A schematic showing the process flow from the entry of a Requisition to the payment for the goods received is shown below.

Requsition to Payment

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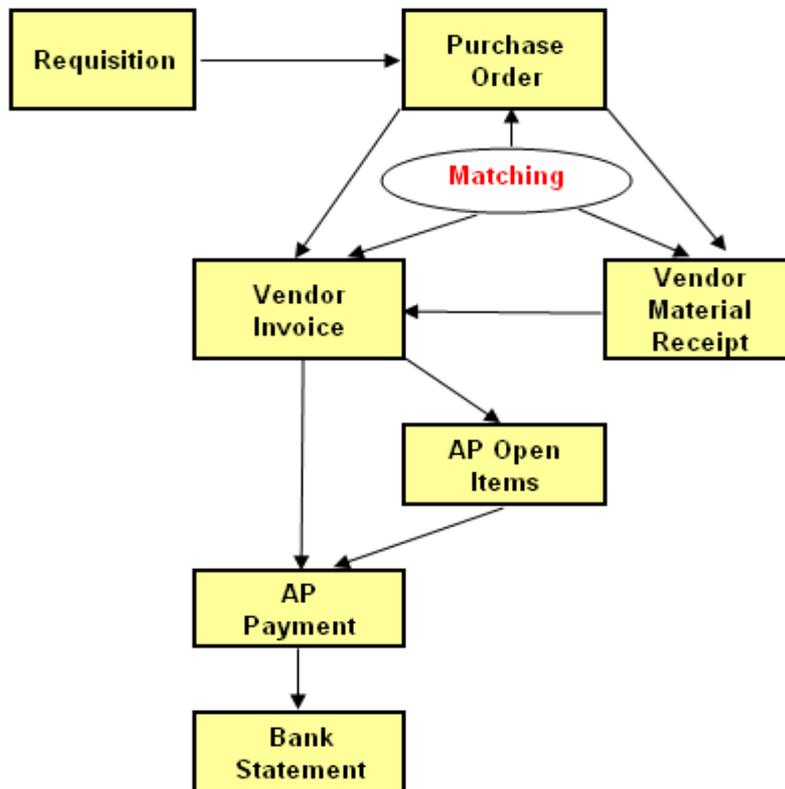
4.1 Requisitions

Requisitions can be raised automatically from Material Replenishment Reports or alternatively entered manually. A sample workflow implementation is delivered with the standard product and requires Requisitions in excess of $100 to be approved. On approval a report of approved Requisitions is a prepared automatically from which purchase orders can then be raised manually.

This workflow is provided as an indication of the way that a Document Workflow can be setup. Purchase Orders are optionally automatically generated from the processing of a Replenishment Report.

4.2 Purchase Orders

Purchase Orders can be generated (and consolidated, if required) from Material Replenishment Reports or manually entered.

ADempiere supports two-way and three-way matching with receiving and invoicing documentation and following matching Purchase Orders are automatically closed to minimise overhead on the PO screens but remain accessible via reports.

4.3 Material Receipts

Material Receipts are processed by creating a material receipt record. Material Receipt records are then matched to the Purchase Order or Vendor Invoice. Material Receipt records can be auto-created from Purchase Orders or Vendor Invoices to avoid the overhead of additional data entry.

4.4 Vendor Invoices

Vendor Invoices are entered based on the vendor's invoice document or may be created from (and matched with) Purchase Orders or Material Receipts as 'Recipient Created Tax Invoices'. Material Receipts can also be created automatically from the vendor invoice when the invoice and shipment are received concurrently. Invoices for miscellaneous business expenses are able to be processed without purchase orders and can be copied from equivalent prior invoices or set up as 'Recurring Documents'

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4.5 Payments

Payments are generated, in batches or individually, based on payment terms which allow for payment discounts to be automatically taken. Payments can be made by direct debit transactions or ADempiere's cheque printing facilities. Payments can also be made by credit card and details can be recorded when entering the Purchase Order or Invoice. Credit Card numbers for completed transactions have the middle 8 characters removed when stored in the system. ADAXA provides an add-on to the standard version of ADempiere to provide payments in the file format required by Australian Banks.

4.6 Returns to Vendor

ADempiere can automate your return to vendor processes through Vendor Return Materials Authorization (RMA). Vendor RMAs are linked to the original Purchase Order and Material Receipt. The Vendor Return Policy can be used to control whether the goods are eligible for return. Vendor RMAs can be matched to Return to Vendor transactions and Credit Memos. Return to vendor transactions can be entered directly as new documents, or created from a Vendor RMA. If they are created from a Vendor RMA, all the details of the Vendor RMA are automatically copied over to the Return to Vendor. The Generate Credit Memo process can be used to generate the Credit Memo. Alternatively, the Credit Memo can be manually entered and matched to the Return to Vendor transaction.

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5.1 Payment Rules (Receivables and Payables)

Depending on the payment rule associated with the vendor invoice, payments are automatically created. Payment rules can be changed at any time to reflect changes in the actual method of payment and in the event that it is decided to pay an invoice using an alternative method. The following payment rules are supported by ADempiere:

- Cash
- On Account (Payment Term)
- Credit Card
- Cheque
- Direct Debit transfer

5.1.1 Cash

When cash is selected as payment method, an entry is automatically made in the default Cash Book for that day.

5.1.2 On Account (Payment Term)

For 'on account' customers (ie those with a credit limit) the payment term defaults to the payment term in the Business Partner definition unless another payment term is specified by the user.

5.1.3 Credit Card

Credit card transactions can be entered and processed online. The invoice is marked as paid and the charge maintained in the system as an unreconciled payment. Note that use of this facility may require modifications to meet the needs of the credit card organisation that you deal with.

5.1.4 Cheque

After selection of the appropriate bank account, cheques can be entered into the system. The associated invoice is marked as paid and the cheque maintained in the system as an unreconciled payment.

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5.2 Payments

Payments records (via Credit Card, Check, Transfer) can created when an invoice being paid or can be entered into the system later. If a manual Payment pays a single invoice the invoice is selected in a dropdown list and automatically matched to the payment. If a manual Payment pays multiple invoices then the payment and the matching invoices are selected in the Payment Allocation window. System generated payments automatically match and clear their respective invoices.

5.2.1 Allocation

The Allocation process links (multiple) payments to (multiple) invoices or credit memos and records payment discounts and receivable write-offs. The user selects the relevant documents and then enters/confirms the difference as a short payment, discount or write-off. The Allocation process also records realised gains and losses on foreign currency denominated AP and AR transactions.

5.3 Bank Statement

Bank Statements items can be selected from a system-generated list of unreconciled payments or automatically loaded from electronic details supplied by the financial institution. ADempiere provides functions to allow for the reconciliation of in-transit payments and bank charges or the creation of payments for direct debit transfers. Modifications may be required to support the requirements of your financial institution.

5.4 Cash Book

Petty cash transactions are recorded in the relevant cashbook. Invoices paid by cash are automatically entered in the cash journal. A cash journal is created for each organisation for each day.

The Cash Journal may also be used to record:

- General expenses (for accounts defined in the cashbook)
- General revenue (for accounts defined in the cashbook)
- Petty Cash differences (for account defined in the cashbook)
- Charges
- Cash payments of Invoices to a customer or from a supplier
- Transfers to or from a bank account.

The Cash Journal is processed after balancing adjustments are made by creating a new cash journal with the correcting entries.

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5.5 Charges

In many systems miscellaneous expenses and revenues are allocated directly to GL account codes.   In ADempiere these items are entered by selecting a "Charge" which acts as an alias for a GL account code. This allows Adempiere to support multiple charts of accounts as the Charge can be linked to Account 123 in the first AUD Chart of Accounts and to (say) Account 789 in the second USD Chart. Where a single Chart of Accounts is used then the Charges are simply named/numbered the same as the GL account codes they link to.

The user can define the tax type of the Charge. If Customer or Vendor Invoice lines are allocated to a Charge, the tax rate defaults to the defined tax type of the Charge. The amount of a charge can be predefined to speed data entry. The currency of the document determines the currency of the charge.

5.6 Expense Allocations

Default allocation of expenses (or revenues) can be defined so that an expense of a particular type and/or from a particular vendor is split up and allocated over multiple Organisations and/or account codes.

5.7 BAS Returns and GST

ADempiere produces reports of all invoices containing GST to enable simple completion of BAS/GST returns. Details of BAS return preparation is beyond the scope of this document. Please refer to the Adaxa How-To guide for more details.

https://docs.google.com/a/adaxa.com/folder/d/0B3bIqlUcP8LccElYY25nNkNCMlU/edit?docId=0ByPzKfdoZESTL-W5VeDhjV3lvN2M

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6 Customer Relationship Management

Customer Relationship Management is not an independent module, but a logical view of all customer and prospect related activities.

Customer Relationship Management functions are an integral part of the business process. As a result, there are no batch or synchronisation processes for the back-office functionality as is normally required with traditional CRM systems.

6.1 Lead and Activity Tracking

ADempiere has an in-built case management system of the type that is typically used for managing support requests, sales enquiries, complaints and the like. In ADempiere this process is called "Requests Management". ADempiere supports the following types of Requests in the CRM area:

- Information - (un)structured requests from web or email sources
- Service - structured requests to perform a service at a given time and place
- Charge - structured requests to reimburse costs
- Account - structured requests concerning a customer or vendor order, shipment, invoice or payment
- Warranty - structured requests concerning a product or service issue
- Help – (un)structured customer service requests

Depending on the type of request, it can be automatically converted to a target document (e.g. an offer, order or invoice). A confirmation email with tracking number can be sent manually or automatically. Requests can be assigned to particular system users for action or follow-up.

By utilising the tracking number, the Request creator can update information in the Request. Request Management capabilities within CRM ensure timely response, escalation in accordance with a defined process, timescale and closure.

Requests can also be generated based on the account status (e.g. date of last sale, overdue payment, etc.) for customer service or sales to follow up.

Requests can also be created automatically from incoming email messages sent to special purpose email accounts (info, sales, accounts etc). Attachments on these emails can be automatically attached to the created Request.

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6.2 Marketing Campaign Management

Customer retention is a crucial mission for every company. ADempiere supports this by creating mailings or requests for the (tele)-sales force to follow up. Criteria for a campaign could be last sale, sales volume, products purchased or a variety of other triggers.

To attract new customers, addresses of prospects can be imported for mailings or requests for the (tele)-sales force to follow up. The effectiveness of marketing campaigns can be measured by the revenue or gross profit generated for each campaign by linking each document (e.g. Invoice or Order) to the relevant campaign at the time of invoice creation. This information is then available within ADempiere for reporting and analysis.

6.3 Promotions

ADempiere provides for the management of Promotions with promotion codes. A promotion defines what price reductions, gifts or other benefits accrue to the buyer when certain conditions are met. The changes are automatically applied when the sales order is 'prepared' or 'completed'. The Promotions apply to both webstore and normal sales.   Promotions can be linked to Campaigns for simple financial analysis and reporting.

6.4 Customer Profitability Analysis

Reports on revenue and gross profit of specific customers or customer groups over a period of time can be generated using the report writing capability built into ADempiere or by using third party report writers and/or OLAP viewers.

6.5 Self Service Online Inquiry

The system allows authorised Business Partner Contacts (i.e. customers, vendors or employees) to access the system to view or query information relevant to that Business Partner using a web browser. The information may be used for such purposes as obtaining information on account balances, invoices and the like and to initiate follow-ups and make payments against outstanding open items.   Self service can also be used to allow customers to register to receive permission based marketing material for selected interest areas and to download files such as material data safety sheets or any other relevant material.

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7 Partner Management

Partner Management links different clients to each other allowing them to manage lead distribution, service requests collateral distribution and marketing expenses. It also allows for the provision of (centralised) services and is shown diagrammatically in the schematic below.

7.1 Shared Services

ADempiere facilitates the management and provision of shared services (e.g. a franchisor providing Accounting, Help Desk, Shipping, etc. to a franchisee). The user/franchisor has access to the information needed for its tasks across multiple Clients and organisations. The franchisee has access to only its information.

7.2 Centrally Maintained Information

The system can maintain centralised data like Products, Price Lists or Accounting Information for all business partners. Partners can add additional entities for their own entitybut cannot change the centrally maintained elements for consistency and security. This combination of central and locally maintained information provides for the management of a 'network of organisations' typically found in a franchised operation or those organisations that provide central functions for otherwise independent associates.

7.3 Counter Documents

ADempiere provides functionality which enables independent but related organisations to automatically generate a 'counter document' in another organisation. Assume a franchisee (a separate legal entity) places a Purchase Order on the franchisor. The corresponding Sales Order can be automatically created in the franchisor's ledger. When the franchisor ships and/or invoices to the franchisee a corresponding material receipt / vendor invoice will be automatically created in the Franchisee's books and so on. The documents will optionally be completed or pending completion by the recipient.

This functionality ensures that GST is correctly handled between the separate legal entities and also provides for the products to be recorded at different costs in the franchisor and franchisee accounts. Furthermore it significantly reduces the effort involved in processing the transactions.

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8 Supply Chain Management

Supply Chain Management covers all material management activities including inventory receipts, shipments, movements and counts within a Client, its organisations and to and from suppliers and customers. The schematic representation of the process is shown in the schematic below.
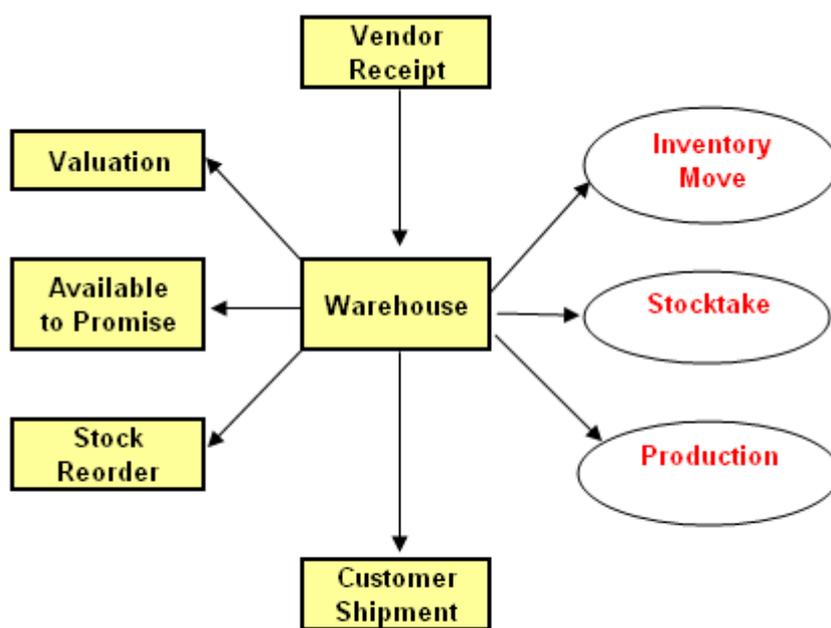
Supply Chain Management

8.1 Product Catalogue

The Product Catalogue lists the user's Products and Services with optional Bill of Materials and Substitutes. The system allows the user to import and update purchase prices from its vendors.

Products are organised in categories and hierarchies and can also be searched based on attributes that apply over a number of products, for instance "find me all products that are yellow shirts with short sleeves".

Multiple price lists are supported for all purchased and sold items. ADempiere's purchase price list functionality allows simple control of discounts from suppliers. The system provides general and customer specific sales price lists. Price lists are 'date controlled' to allow new price lists to be creatd well in advance of their start date.

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8.2 Distribution and Multi-Warehouse Control

ADempiere supports multiple warehouses with user defined locations within each warehouse for recording stock locations in shelves and bays (Bin Locations). A physical warehouse can be broken into multiple logical warehouses such as receiving, quality assurance and testing, bulk storage and picking. Priorities can be set to ensure that picking takes place from bin locations in a prescribed sequence. Inventory movements can be effected between bin locations and warehouses. Movements between warehouses can be configured to produce appropriate shipping documentation and manage 'in transit' stock.

Stock counts and stock valuation adjustments are managed by recording the difference between the book stock quantity and the count quantity and processing any difference so that sales activity can continue in parallel with the stock take data entry process.

Stock used for internal purposes can be easily written off to record the stock decrement and consequent financial entries in the Financial Ledger.

8.3 Materials Management

Shipment documentation can be created in batches or individually on a per order basis. Goods received from vendors can be compared directly with the purchase order or the vendor invoice.

The system shows 'available to promise', after allowing for reservations for committed future customer shipments and expected vendor receipts.

Material Replenishment lists are created based on inventory replenishment rules. Requisitions or Purchase Orders can also be automatically generated from the Material Replenishment report.

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Performance Analysis covers the costing and accounting dimension of the application. In traditional systems, this functionality usually appears in modules called Reporting and General Ledger as well as those modules which generate accounting entries. A diagrammatic representation of Performance Analysis is shown in the schematic below.
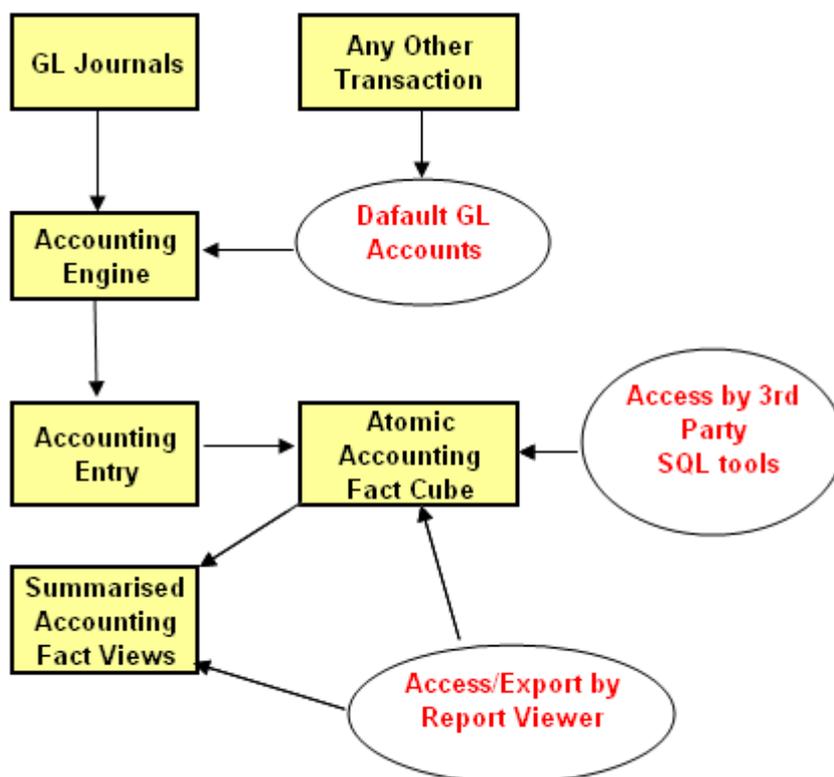
Performance Analysis

9.1 Accounting Rules

Accounting entries are automatically generated based on rules which apply to Document transaction types defined by the system which are able to be extended by the user. The rules define the natural account codes for each group of transactions generated by an accounting document. As a result transactions are entered into

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the system without the user's staff needing to know anything about account numbers. The system also allows for manual entries to generate additional postings (actual, budget and statistical).

9.2 Integrated Reporting, Data Warehousing and OLAP

Reports can be created for every type of Document in the system. The user can define the layout, sequence, labels, format and totalling for any report and make it available for any system user or organisation by setting the security appropriately. Report Views enable analytical and summary reporting.

The reporting facility allows drill down to underlying elements (e.g. from order to business partner, payment rules, etc.) or drill across to referenced items (e.g. from order to invoices, or shipments linked to that order). This reporting facility is applicable across the entire system allowing any information that can be shown on the users screen to be output with a report format and content specified by the user.

All report information can also be exported in a variety of formats suitable for use in spreadsheets and word processors. Business Views provide for reporting by external dedicated SQL based reporting tools such as OLAP viewers. Additional Business Views can be created or existing views extended to allow more detailed ana-lysis where necessary.

9.3 Manual Journals

The majority of accounting transactions are generated as a consequence of the processing of Documents. This allows the recording of individual transactions in multiple accounting schemas. Manual journals allow for the creation of accounting entries for a specific accounting schema. Auto reversing Journal entries are supported and ADempiere's standard recurring document functionality can be used to process standing journals (and any other document based transaction).

9.4 General Ledger Distributions

The system provides for the creation of user-defined rules to cause amounts debited or credited to the system by any document to be spread over multiple General Ledger accounts.

9.5 General Ledger Reconciliations

Adaxa has contributed a General Ledger Reconciliations tool that has been very well received by accounts staff and which simplifies all general ledger reconciliation process.

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Details are shown here:

https://docs.google.com/a/adaxa.com/folder/d/0B3bIqlUcP8LccElYY25nNkNCMlU/edit?docId=0B3bIqlUcP8L-cbExESGRkS2cwREU

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10 Web Store

The ADempiere Integral Web Store provides a functional web presence for an organisation. The information is shared with the standard application eliminating the need for synchronisation or additional integration between the web store and the back end application. The web store components are based on cascading style sheets and can be readily customised to provide the look-and-feel required. A diagrammatic representation of the integral web store functionality is shown below.

Web Store Schematic

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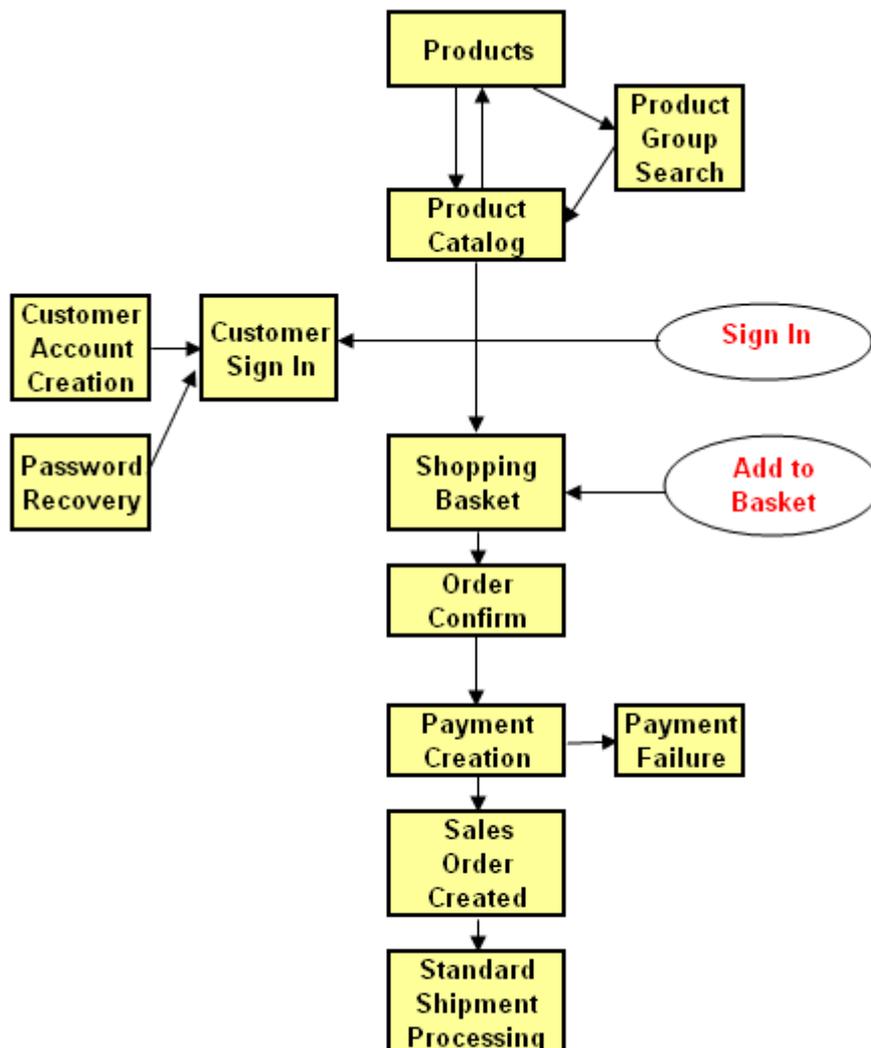
10.1 Online Product Catalogue

Users are able to view and search the product catalogue. Product images and specifications are stored for each product and can be displayed on the web store at the users discretion. The products available on the web are able to be restricted according to the Business Partners' access rights and once a user has logged onto via the web store products are ranged and priced according the pricing specific to the customer.

Hierarchies are able to be defined to limit product selection and products can be searched by Product Category and/or Product Attributes.

10.2 Online Sales Transactions

ADempiere enables users to add items to the Shopping Basket via the Product Catalogue or web form request. Item quantities can be changed and items deleted from the shopping basket. It is mandatory to sign on with secure access to retrieve stored customer information. The payment information is then entered or confirmed. Currently, the Paypal, eWay and PaymentExpress payment processors are supported. Others can be easily added. Before submitting the payment for authorisation the credit card number can be verified for data entry errors. This ensures that transaction fees are minimised for rejected transactions resulting purely from erroneous data entry.

After receiving the payment confirmation, the order is created and the receipt is displayed together with the authorisation code received from the payment gateway.

An email is sent to the person responsible for Web Orders to notify them of the order and effect further processing..

[Note: Adaxa also offers the Egility e-commerce system which is a Drupal module that acts as a "presentation layer" for the Adempiere system. More information is available at http://www.egility.biz/   ] Egility is focussed on providing the normal Web 2.0 type experience of a modern B2C site. The integral website is well suited to B2B transactions or B2C with more limited requirements.

10.3 Supporting Components

10.3.1 User Management

User information can be stored and cookies enabled to allow automatic detection and sign in. Users are required to authorise their email address to reduce the possibility of fraudulent transactions.

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10.3.2   Counter

The system monitors web requests and collects web statistics to analyse web activity and identify visitors to the site as well as click counts.

10.3.3   Info Requests

A web user Request can be forwarded to one or more email addresses for action. A confirmation can also be sent to the requester. The Request becomes part of the Customer Relations Management information base.

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11 Manufacturing

ADempiere provides two levels of Manufacturing functionality. These may be considered as "Manufacturing Light" and a full MRP2 implementation. The full MRP2 implementation was added to ADempiere during 2009.

11.1 Manufacturing Light

Standard ADempiere ERP & CRM provides substantial elements of manufacturing insofar as it supports complex nested Bills of Material. A BOM Product can be 'produced' and finished goods inventory will be incremented and raw materials and service inputs credited. Production recoveries and variances are calculated and booked during back-flushing.

ADAXA has created extensions to ADempiere production functionality that enables it to function well particularly in an environment where many products are made to order.   The extensions are mainly focussed on simple manufacturing processes where complex shop floor planning is not required. It has been shown to function effectively in an environment where BOMs may be up to 15 levels deep, where a product may be made partly made of itself and where the quantities made and consumed and the particular ingredients may be subject to change after production commitment.

Further details of Adaxa's Manufacturing Light module can be found in the HowTo section of the Adaxa.com website. The document is at this address:

https://docs.google.com/a/adaxa.com/folder/d/0B3bIqlUcP8LccElYY25nNkNCMlU/edit?pli=1&docId=0ByPzKf-doZESTZnB3SFRQcnZMRm8

11.2 MRP2 Manufacturing

This 'heavy weight' manufacturing implementation has been contributed by ADempiere supporters from the Americas and is now available for all to use. The functionality provided will seem familiar to many as the writers of the module were implementers and supporters of MFG/PRO for many years.

The depth of functionality is perhaps best illustrated from the menu screen shots shown below.

The screen icons have the following meaning

is and add/edit/delete/report **Window**

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⚙ is a runnable **Process**

▤ is a **Report**

▢↳
▣ is a simple **Workflow** definition used to list a series of steps during setup.

- 📂 Manufacturing Management
  - ▢↳▣ Manufacturing Management Setup
  - 📂 Engineering Management
    - ▤ Change Notice
    - ▤ BOM Change Notice
    - 📂 Resource Manufacturing
      - ▤ Resource Type
      - ▤ Manufacturing Resource
    - 📂 Manufacturing Workflow
      - ▢↳▣ Manufacturing Workflow Setup
      - ▤ Manufacturing Workflows
      - ▤ Manufacturing Workflow Editor
    - 📂 Bill of Material & Formulas
      - ▢↳▣ Bill of Material & Formula Setup
      - ▤ Bill of Materials & Formula
      - ▤ BOM & Formula Info
      - ⚙ Multi Level BOM & Formula Detail
      - ⚙ Mutiple Components Change
      - ▤ Product Configuration BOM
  - 📂 Planning Management
    - ▢↳▣ Planning Management Setup
    - 📂 Product Planning
      - ▤ Product Planning Data
      - ⚙ Create Product Planning
    - 📂 Forecast Management
      - ⚙ Calculate Forecast
      - ▤ Forecast
      - ▥ Forecast Report
      - ▥ Forecast Report by Period

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- 📁 **MRP**
  - 📄 Material Requirement Planning Setup
  - ⚙️ Calculate Low Level
  - ⚙️ Create Record MRP
  - ⚙️ Calculate Material Plan
  - 📄 MRP Info
  - 📄 MRP Notice
  - 📄 MRP Notice (all)
  - 📄 MRP Details
  - 📄 Planned Order Approval
- 📁 **CRP**
  - 📄 Capacity Requirement Planning Setup
  - ⚙️ Calculate Capacity Plan
  - 📄 Resource Load View
  - 📄 CRP Info
- 📁 **DRP**
  - 📄 Distribution Resource Planning Setup
  - ⚙️ Calculate Distribution Plan
  - 📄 DRP Details
- 📁 **Production Management**
  - 📁 **Discreet Manufacturing**
    - 📄 Discrete Manufacturing Setup
    - 📄 Manufacturing Order
    - 📄 Manufacturing Orders Review
    - ⚙️ Component Check
    - ⚙️ Print & Release Order
    - 📄 Order Receipt & Issue
    - 📄 Inventory in Process
    - 📄 Order Transactions
  - 📁 **Management Maintenance**
    - 📄 Spare parts

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- Activity Control
  - Activity Control Report
  - Shop Floor Transaction Details
- Distribution Management
  - Distribution Management Setup
  - Distribution Network
  - Distribution Order
  - Distribution Order Detail
  - Distribution List
  - Distribution Run
  - Distribution Run Orders
  - Generate Movement Manual
  - Generate Movement
  - Inventory Move
  - Material Receipt Distribution Order
  - Move Confirmation
- Quality Management
  - Quality Specifications
  - Bill of Materials & Formula
  - Print Test Results
- Standard Costing Management
  - Create Doc Type to Manufacturing
  - Frozen/UnFrozen Cost
  - Create Element
  - Copy Price to Standard Cost
  - Workflow Cost Roll-Up
  - Bill of Material & Formula Cost Roll-UP
  - Cost BOM Multi Level Review
  - Cost Collector

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12 Technical Overview

12.1 Technical Architecture

12.1.1 Technology

ADempiere provides integrated Customer Relations Management, Partner Relations Management, Supply Chain Management, Enterprise Resource Planning, and Online Analysis Processing. The application was designed to be Cloud hosted and allows flexible deployment options.

The Active Data Dictionary based application ensures stable functionality with a consistent look and feel. The functionality was designed for global deployment supporting multi-lingual, multi-currency and multi-accounting.

ADempiere is designed to change as the business evolves. At any time, even in production, system users can change the information structure of accounting and other business information, adjusting to new needs without adverse impact. In contrast, traditional systems are often accounting driven, resulting in an information gap which is filled by derived information or expensive ineffective bridges.

ADempiere provides multiple views of a user's information based on the detail of the actual transactions. This structure allows maximum flexibility and easy integration of supplemental external information. As these are just views of the information in the database, they can be changed quickly.

12.1.2 Technology Stack

ADempiere is a 100% pure Java solution based originally on Postgres or Oracle database.

The client application component is written in Java and is designed to utilise the capacity of today's PCs. The Java Desktop client is the preferred choice for high data volume and provides a high performance graphical user interface. It communicates, via thin JDBC, with the database and via RMI with the application server.

As an alternative, an AJAX browser client can be used, where the installation or download of the application is not appropriate (i.e. typically on a Cloud-hosted system or where providing self-service functionality for vendors, customers, employees). The available functionality provides nearly all of the functionality provided by the Java Desktop Client.

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12.1.3 Database Options

ADempiere generates the SQL statements and parses them for security. The database independence layer then converts the SQL to the target database notation. The setup program packages the required libraries for deployment of application servers and clients.

This approach eliminates the need to 'port' ADempiere to other database engines and allows new releases to be available on all platforms simultaneously.

12.1.4 Database Decision Criteria

Adempiere requires full support of ANSI SQL 99, support of Views and Views on Views, support of User Defined Functions, Inline Views, JDBC 3.0 Support.   The database is crucial for any ERP/CRM application and users will want to select a database based on the following criteria. You may not need all of them to the full extent and you can compensate, e.g. by access to an experienced database administrator but the following are matters for consideration in the choice of database:

- ●   Cost
- ●   Self managing - is the database self-tuning and extending?
- ●   Stability - can the database run without maintenance/shutdown for years and tolerate program and operating system crashes with automatic recovery?
- ●   Availability - is it possible to run the database 24/7 (if you have a web store), do cold/hot backups and provide automatic fail over
- ●   Performance and Scalability - does the database include performance wizards, function indexes, use additional CPUs and Hardware RAID and have the ability to cluster ("grid") the database.

Clearly a mission critical production environment will benefit from using a database that is well understood by ADempiere supporters. Presently the majority on newer ADempiere implementations are choosing to deploy on Postgres. Older implementations probably chose Oracle (or Oracle XE) since at that stage Oracle was better supported by ADempiere.

12.2 Workflow and Business Process Management

Workflow is usually defined as "steps involving people", whereas Business Process Management is defined as "workflow and system activities".

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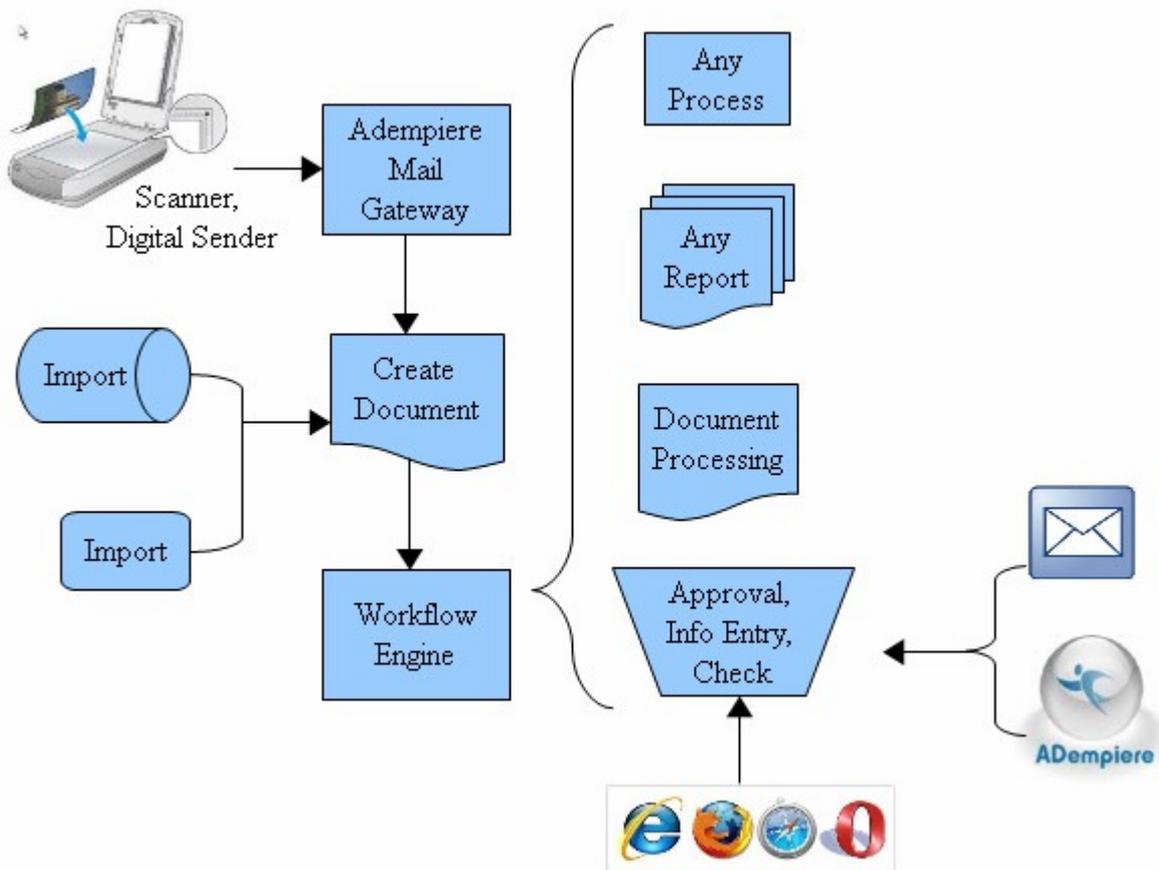
Workflow Schematic

ADempiere fully supports Business Process Management (BPM) and is based on the Workflow Management Co-alition and OMG standards. In the following, we use the term Workflow to include BPM capabilities.

In contrast to other ERP and CRM applications, Workflow is not "on top" of the application; ADempiere is based on Workflow. The ADempiere Workflow Engine is ADempiere's core transaction management. That means that all processes in ADempiere are automatically workflow enabled and easy to extend and modify. As workflow is completely integrated, ADempiere workflows are easier to maintain and can provide much more functionality then the external or ad-on workflow offerings of some other ERP and CRM vendors.

12.2.1 Types of Workflow

ADempiere provides three types of workflow:

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●   **General Workflow** - Provides guidance and step-by-step instructions for achieving a task. Examples of general workflow in ADempiere are the setup wizards. This type of workflow is initiated by a user from the menu.

●   **Document Process Workflow** – This type of workflow controls the processing steps of all document and is automatically started when processing a document. Typically this type of workflow could be extended to cater for approval of a document where Purchase Order may exceed a certain value.

●   **Document Value Workflow**- This type of workflow is automatically started when any entity fulfils a user defined condition. An example may be the approval process for a new customer where credit and pricing approval is required prior to the trading with the new customer.

12.2.2   Node Actions, Transitions

An ADempiere Workflow Node (Step) can have the following Actions

●   **Automatic Process** - Any Process, Report, Task, Workflow, Document Action.
●   **User Action** - Any Window, Form where a user needs to confirm Completion
●   **Set Variable** - Any Column to Constant or Variable
●   **User Choice** - Any Choice (e.g. approval), List selection
●   **Wait (Sleep)** - can also be used for Start/End/etc.

Transition between nodes can optionally have conditions. Multiple transitions from a node allow parallel processing. This enables complex scenarios to be modelled using ADempiere's workflow functionality.

12.2.3   Approvals (Responsible Persons)

Users can define an approval hierarchy or use the organisation hierarchy defined in Adempiere. A person responsible for a workflow can be a human (specific or invoker), a group (role), or (supervisor) of an organisation. Different persons can be responsible for each workflow node/step.

12.2.4   Priority, Escalation and Alerts

ADempiere provides dynamic priority management enabling ADempiere to be used for Call Centre routing and priority based customer support. Users can define escalation rules resulting from inactivity and send alerts to the persons responsible for the workflow and/or the supervisor.

12.3 Deployment Options

ADempiere has the following main components:

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12.3.1 Clients

- Java Application
- ZK Ajax Web Client
- Mobile Phone UI running in a Webkit based browser.

12.3.2 Application Server

The application server provides the following functions:

- serves web pages for the ZK webui interface
- manages any schedules tasks that are created inside the application
- performs accounting posting of documents if server-based accounting processing is selected.
- processes all workflows not set to be processed by the Desktop client.

12.3.3 Database Server

All application components can be deployed on all Java enabled platforms including Windows (XP to Windows7), UNIX, Linux, Macintosh and Apple XServers.

A variety of configurations are supported. Where communication bandwidth allows, the Java application client can be deployed. Over the WAN, secure access can be provided using a terminal services approach using proprietary or open source solutions such as Citrix, Windows Terminal Services or NXServer on Linux.

For the Mobile Phone UI HTML client, a Java Servlet and JSP (Java Server Pages) Server is required. In addition to the standard HTTP Internet communication, the SSL secure protocol is used for implementing web store functionality.

The JBoss based application server can be deployed as a stand-alone tier or on the same server as the database server. Java Management Extensions (JMX) are used for Server Management.

The Database Server hosts data and application logic and is accessed by the standard JDBC (Java Database Communication) protocol.

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13 Application Architecture

Business applications change over time. They need to utilise new technology and always need to provide addi-tional and smarter functionality. Packaged applications must also support additional customer specific function-ality, although it is often not suitable for integration in the core functionality (e.g., customisations and certain extensions).

Even though it is known that requirements for packaged applications are constantly changing over time, very few applications are designed to sustain change and additions.

Business applications can have a long life expectancy and tend to provide more functionality over time due to enhancements, so it is important to provide a framework to manage this proliferation of complexity. If applica-tions are not designed to sustain increasing complexity they will become unstable as extra functionality is graf-ted onto the base application.

ADempiere has an Object Architecture (compared with Object-Oriented, Object-Like or traditional Architectures). Every Object is as independent as possible from other Objects - including transactional decoup-ling.

13.1 User Interface

The Application User Interface and HTML screens are generated at runtime based on rules in the Application Dictionary. The result is a consistent User Interface, allowing users to navigate quickly in unfamiliar application areas. This method of generating a user interface enables rapid development and the resulting system is very stable.

This method also enables screen layouts to be modified or extended and new windows created by system ad-ministrators without the need to modify any code. Users automatically see the "new" or modified window the next time that they select that menu item.

The Desktop application utilises the computing power of today's PCs and may be preferable in situations where fast reaction and navigation is important.

The AJAX browser interface utilises the ZK Enterprise Framework. ZK is a well proven Ajax + Mobile framework designed to maximise enterprise operation efficiency and minimise the development cost.

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ADempiere also provides a mobile phone UI running inside a hidden Webkit browser. The system is mainly focussed on reading existing information rather than adding new records (like sales orders) since the small screen size limits what can be done effectively. A document about the Admpiere Smart Phone application is available in the "How To Use ADempiere section of the adaxa.com websiteZK at

https://docs.google.com/a/adaxa.com/folder/d/0B3bIqlUcP8LccElYY25nNkNCMlU/edit?docId=0B3bIqlUcP8L-ccEQ2cjJXbjFGZnc

The Data Dictionary knows about structure and dependencies. This allows a user with the right access to zoom from any screen element to the window where the data is maintained in order to update or enter new information. Users can enter a new customer or update existing customer information while entering an order without leaving the original window.

The Data Dictionary allows the user to quickly access information. If more entity information than, for instance, a company's name is required to be viewed, the 'Info' functionality can be invoked. For example, the Customer Info includes address and credit line information; the Product Info includes prices, margin and availability. Info is used if the user needs more information to make a choice and is always available. The selection can be sorted and where appropriate, multiple records can be selected.

Users can Query records. Queries reduce the number of records in a window by allowing the user to enter one or more selection criteria in an enhanced 'query by example' style window tab accessible throughout the application.

A user with the necessary permission can customise Window layouts and can tailor screens for a specific situation and client. All users can set default values in fields on their screens to avoid reselecting commonly used values.

13.2 Smart Reporting

For most other applications, Reporting is a separate or add-on entity. ADempiere's reporting is based on the data dictionary. As the report viewer has access to the definitions, this enables the ability to drill-down to any entity referenced and to drill-across to entities in any report (refer to sections 13.2.1 and 13.2.2 below). The links are automatically generated and highlighted on the screen. The drill down and across functionality adheres to the security and access definitions.

Business Views are designed for end users and allow access to information using standard SQL based tools without the need to create SQL table joins. The majority of Business Views are generated based on the Application Dictionary.

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All reporting output can be viewed on screen before sending it to a printer or generating files in many different formats (e.g. Excel, HTML, XML, Word and PDF).

13.2.1 Drill-down

When drill-down is used, a new report is generated based on the entity selected. In an order report, for example, it is possible to drill-down to the order lines by double clicking on the order header line.

Additionally drill-down is available by source transaction. Examples are:

- reports where a displayed number is an addition of numbers
- drill-down from a summarised monthly amount to the original transactions

13.2.2 Drill-across

Drill-across allows the user create a new report where a specific entity is used. For example, in a Product report a user may select a specific line (product); then drill-across to an Order-Line or Invoice-Line Report to display only the lines, where that product is referenced.

13.2.3 Reporting Types

ADempiere enables three types of reporting facility

- Lists reports from each window
- Financial reports
- OLAP views (using the Oracle OLAP tools or other third party OLAP tools)

Lists are based on Window information and multiple reports can be generated for each window in the system. Any of these reports can be initiated from within a particular window or alternatively placed on the menu with selection parameters defined by the system administrator. List reports can be displayed as 'summarised' by clicking on the 'Summary' button. The report will then be summarised for all items where the 'Group By" tick-box is set.

Reports are used to display atomic or summarised information which are based on Report Views.

OLAP viewers provide different dimensions (such as accounts, products or customers) to be viewed in a tabular or graphical format. ADempiere supplies the necessary information for display in a third party OLAP viewer of the user's choice. Data can also be warehoused in third party data warehouses of the users choice. [Note that graphs can also be created and displayed in any Adempiere window as "Chart" is a standard window data element type.]

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13.2.4 Customising Reports

ADempiere differentiates the 'view' from the 'model'. A number of standard views are provided but additional views of the data can be created with a user-provided SQL Select statement. In contrast to other applications, the user doesn't need to resolve foreign key references (which require knowledge of the data model) or worry about data security since ADempiere automatically resolves these issues.

Few people agree on how each report should look. ADempiere allows the user to define reports at the System, Client, Organisation or User level:

- Report columns
- Column order
- Report sorting
- Column heading
- Sums, counts, minimum, maximum, mean, deviation and variance (for numeric columns)
- Grouping
- Number and Dare formats

The language of the report is based on the user's language selected at logon time. Each user can have a different language. The structure of the report is copied from the lower of System, Client, or Organisational level.

Data selection is via Report Parameters entered when initiating the report, or via the advanced Query panel allowing the user to enter criteria in an enhanced 'query by example' style.

13.3 Safe-fail

Usually applications are designed to be fail-safe. It is assumed that everything works and all data is entered correctly and is consistent. In the case of failure, experts have to search for the cause and check for damages. The user usually notices the problem some time after it has occurred. The reality is that applications do sometimes fail.

In contrast ADempiere is designed to be safe-fail. Every transaction can be repeated and regenerated. Most failures are identified by the system and the user can attempt to fix the problem. If recovery is not possible, the error is isolated and the rest of the system continues to work. Transaction de-coupling design is the basis for this ability.

As an example let's say the substructure of the transaction to sell a product over the counter is as follows:

- Material Transaction (adjust inventory)

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- Generate Material Accounting (for each Accounting Schema)
- Post
- Invoice Transaction (calculate tax and create invoice)
- Generate Invoice Accounting (for each Accounting Schema)
- Post
- Receipt Transaction (create receipt for invoice)
- Generate Receipt Accounting (for each Accounting Schema)
- Post

To have ten or more transactions rather than one or two may seem to look like overkill, but it is actually faster and much more reliable than the standard approach:

When committing, only two sub-transactions are performed, the material and invoice transaction. This ensures a fast return, so that the user can continue with entering the next transaction. The remaining sub-transactions are scheduled, optionally batched and are executed asynchronously in parallel on the server at predefined intervals. This allows the deployment of load-balancing rules to ensure fast online response.

Each transaction only performs one task. This is easier to stabilise and the impact of failure is isolated and easy to identify.

The communication between the individual transactions is message based, allowing asynchronous batching of transactions.

Additional functionality is much easier to implement. The cost of adding new functionality in ADempiere is much less than in many other applications.

The user can continue working with little restriction if the main transaction (e.g. inventory adjustment) is successful. The remaining transactions can be generated, after the underlying problem has been fixed.

The system regularly checks if a transaction is complete. If a transaction is not complete and consistent due to system failure, the administrator and user are informed by a notice message.

As applications become more complex with ever growing combinations, the possibility of error grows exponentially. ADempiere provides an extensive validation framework and if that fails, it isolates the problem ensuring high availability of the core functions.

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13.4 System Security

ADempiere provides comprehensive, yet flexible security to meet the users' needs. Function security is based on User Roles which control access to Windows, Reports and Processes.

Data security for Client and Organisation information is maintained at database level through the security context. This is an additional level of security after the normal database user login. Before accessing any data the user must login via a stored procedure with application username, password, role and optionally the user's language preference. All passwords are stored in encrypted form.

It is difficult to talk in general terms about the security in applications and the following is intended to provide a brief overview of the flexibility and power of the security functionality in ADempiere.

13.4.1 Roles

The first level of Security in ADempiere is defined by Roles. Users are able to logon to ADempiere with a specific Role. A User may have many roles but is granted access to ADempiere based on the single Role selected at login.

Roles define the first level of Security, the Organisations, Windows, Processes, Forms, Workflows and Tasks (hereafter "Entities") that the User can access. The User does not see menu items that they cannot access.

Roles also define the actions that a User can perform in the Entities they can access by Role Control.

13.4.2 Role Control

The Role definition allows a series of actions to be enabled or disabled for the particular Role.

● **Show Accounting checkbox** - allows the Role to access the Accounting tabs on windows The Accounting tabs allow modification of the GL accounts which transactions generated by Documents such as invoices, goods receipts and payments post to. The Show Accounting checkbox also controls the display of the Posted/Not Posted button on Documents which allows the user to force immediate transaction posting rather than batch processing of transactions. It also controls access to the Account Info window which allows the display of accounting information which would usually be restricted.

● **Can Report checkbox** - allows the Role to have the ability to execute arbitrary reports from within Windows.

● **Can Export checkbox** - allows the Role to have the ability to export data. A Role must have the ability to Report to be able to Export.

● **Personal Lock checkbox** - allows the Role to Lock records so no other Role can access them.

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- **Personal Access checkbox** - allows the Role to access Locked records regardless of the Role that locked the record.
- **Read Only checkbox** - controls whether the Role is allowed to update records.
- **Dependent Entities checkbox** - controls whether access should also be restricted for other screens and processes that use this record such as allowing someone dealing with Payments Terms to be able to see Orders, Invoices, etc. where any Payment Term is used.
- **Overwrite Price Limit** – Controls the ability to override any price limits when entering orders or invoices
- **Maintain Change Log** – Determines whether or not the system will maintain a log of changes made by users of this role
- **Access all Orgs** – Controls access to organisations. If this box is not checked it is possible to restrict access to the organisations assigned to the specific user.
- **Preference Level** – Controls the ability of users of this role to set preferences at the Client, Organisation, Window or User level.

13.4.3   Role Data Access

The second level of Security in ADempiere is Role Data Access. For a given Role and its privileges, the security can be further refined by defining access for specific tables, columns or records. For example,

- allowing specific users to only create Sales Orders with Payment Terms of "Immediate"; they are not allowed to offer Credit Payment Terms.
- Preventing Users from using specific accounts in the GL Journal or to see the balances for these accounts.

This can all be accomplished using Role Access.

13.4.4   Personal Lock

If the Role has Personal Lock enabled a padlock icon appears on the toolbar: The lock in the open position in-dicates that this record is open to all users. The lock in the closed position indicates that this record is open to only the user who locked the record and those users whose role has Personal Access enabled.

13.5 Help System

ADempiere has many levels and types of help and support functionality. Some is intended to help the user and other parts are intended to help the support person attempting to assist the user.

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13.5.1 Help for the End-User

ADempiere provides on-line, context-sensitive help for each field on each screen. Hovering over the field name on a window displays the abbreviated help for that field. Users can also mouse click on the HELP button on the toolbar to be provided with access to more extensive help.

The abbreviated and longer help messages are stored in the Active Data Dictionary with the details of the field that the help relates to and the text can be changed or extended by any User with the necessary privilege.

In addition, clicking on the HELP button on the ribbon menu on the top of the screen displays two further help options.

The first is on-line help which opens an internet browser screen which points to a website where additional help information may be stored in a web-server managed by the User organisation which could contain procedural manuals and the like for the organisation.

13.5.2 Help for the Support Staff

The second help option button creates an email to the User organisation's nominated support person or group from the user. The email contains the full information about the user's application/system environment and in-formation about the task being performed when the query was created. This information provides the support person with the context of the user's action which has caused the support request.

In addition to the above, in the user preferences there is a variable "trace level" indicator which controls the granularity of logged information.

13.6 Scalability

ADempiere is highly scalable. Factors contributing to its scalability are as follows:

- Wide choice of hardware and operating systems
- The use of Postgres, Mysql or Oracle as the underlying database
- The ability to deploy multiple application servers

13.6.1 Scalability by Design

The design of ADempiere provides for the de-coupling of document posting processes so that data which re-quires instantaneous update is posted separately from less urgent transactions such as, say, matching a pay-ment and an open-item invoice.

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ADempiere users are not required to "post" the financial consequences of transactions to the system since the application server periodically (under administrator control) sweeps and posts all un-posted transactions.

The de-coupling of time-critical postings from less time-critical postings allows background tasks to occur without affecting more urgent tasks. Transaction de-coupling is the basis for this capability.

As an additional option, the system administrator may select the option to allow the Desktop client to perform the posting of documents in which case posting occurs immediately the document is completed but utilising the the desktop machines power rather than loading the process on the application server.

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14 Information Architecture

ADempiere has an advanced information structure allowing structural changes in midstream breaking the limit-
ations of the old fashioned 'Set of Books' system used by most competitors.

14.1 Multi-Organisation and Service-Centre

The Multi-Organisation capability of ADempiere enables different organisational entities to share data or make
sure that private data is not accessible by other entities. Secure and structured sharing of data is a prerequisite
for centralised functionality, outsourcing or service centre operation.
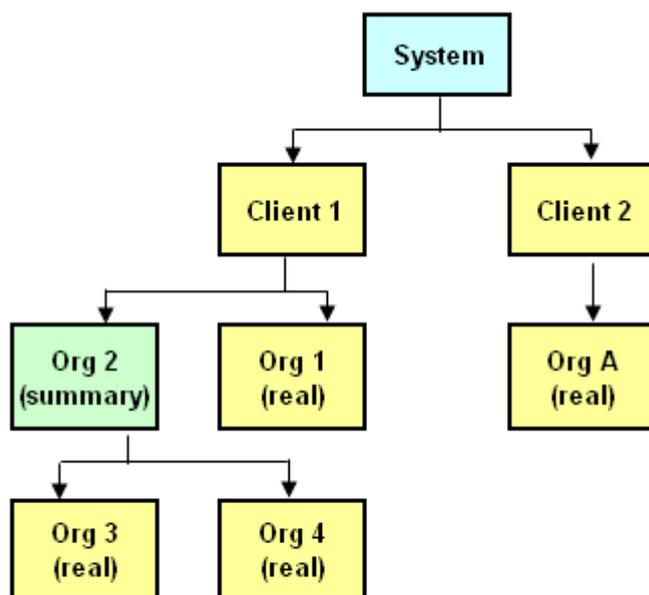
Multi-Organisation Diagram

Many applications have attempted to add this feature, often with inconsistent 'Organisation' definitions in ac-
counting and distribution. Also, the concept of shared and private data is often implemented by replicating data
with its overhead and synchronisation issues.

ADempiere was designed to maintain different organisations and supports three entity levels as follows:

●   System

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- Client
- Organisation (and its associated hierarchy)

System level data is mostly infrastructure information, but can also include system-wide business partners, products, accounting schema(s), etc. The system level is equivalent to the database installation. ADempiere provides tools to synchronise different systems.

Client level data defines information and accounting structure for an entity (or group of entities) as well as common business partners, products and then like for that entity.

The **Organisation** level is the transaction level (i.e. System and Client cannot perform transactions). Organisations can be structured in hierarchies with the children able to access their parent entity's data.

Data at each level can only be entered or modified if the user's role has write privileges for that level. The user can view and use data of 'higher' levels, but not change it. For example: Users with a System level role can access and change System data, but not access or view Client or Organisation level data. Users with an Organisation level role can use all System or Client defined data, but cannot modify any. A role may allow maintaining multiple levels (e.g. specific Client and specific Organisation data).

Certain entities like business partners or products require accounting information. Accounting information is maintained at the Client and organisation level, but not at system level. If you want to share a system level entity, you need to enter (or default) the accounting information. Without this, the entity is not visible for the organisation. This allows an organisation to be selective in what to 'inherit' and overcomes a major hurdle to sharing data. Many applications have the accounting information as part of the normal attributes of an entity, making it difficult to share or forcing the same information structure among the entities that want to share information.

ADempiere also allows users to reorganise their Organisation structure or merge entities.

Service Centres are virtual organisations performing transactions for other organisations. Examples are centralised purchasing or outsourced accounting services. Roles can be set up that allow central departments or external organisations to access the functional area, with access only to the required information. Service centres can access multiple organisations without changing roles, even if the organisations have different information and accounting structures.

ADempiere automatically supports multiple Legal Entity accounting, ensuring that transactions crossing legal entity boundaries are accounted correctly by creating matching intercompany loan transactions whenever a financial consequence affects two Organisations where balancing is set to 'mandatory'.

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14.2 Multi-Component Chart of Accounts

A Chart of Accounts in ADempiere can have up to nine components. Two components, Organisation and Account Code (eg "interest income", "postage expense") are mandatory. The other 7 elements can be any other tables of data that exist in ADempiere (eg Product, Business Partner, Project/Job, Marketing Campaign, Activity, Cost Centre, Asset). Additional user defined tables can also be included as components of a Chart of Accounts.

The table containing all posted accounting consequences contains separate columns for each component of the account code and enables very simple reporting.

14.3 Multi-Currency

The Multi-Currency features are:

- Multi-Currency transactions
- Ability to transact in other than the user's accounting currency
- Ability to revalue transactions due to exchange movements
- Bank Accounts in any currency
- Multi-Currency reporting
- Ability to translate AR and AP transactions or balances for reporting purposes
- Multi-Currency accounting
- Ability to account for transactions in parallel in different currencies

If applications claim to support multi-currency, they usually support only multi-currency transactions, but often don't even support foreign currency Bank Accounts (in ADempiere they are balanced in the foreign currency rather than the accounting currency).

Some applications provide the ability to account for transactions in more than one currency. This is required when translating would result in unacceptable currency gains and losses (e.g. countries with unstable currencies) or there is a need to eliminate Euro rounding differences. Some applications have parallel functionality for multi-accounting, but their multi-currency accounting results in unnecessary overhead.

ADempiere provides full support for all aspects of multi-currency functionality (e.g. price lists, preferred customer currency, etc.), and there is no need to copy or replicate transactions. A transaction may have one or many accounting currencies. Starting, switching and discontinuing a currency is easy due to lack of a primary accounting currency.

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As trade becomes more global, multi-currency features become important. Most applications provide support in this area but with significant restrictions that are avoided in ADempiere.

14.4 Multi-Accounting

An entity may be required to account in multiple, parallel accounting standards due to any combination of the following:

- Different accounting standards
- Different inventory costing methods (e.g., Standard, Average, FIFO)
- Different currencies

Usually, a Set of Books is defined as a set of transactions with the same Chart of Accounts, Calendar, Accounting Currency, Accounting Standard and Costing Method. In some situations, it is sufficient to convert or translate a Set of Books to another Set of Books. For most competing applications, this is the only option. There are situations, where this is not sufficient due to:

- Unacceptable rounding and conversion differences
- High manual effort to convert
- Missing audit trail
- Unacceptable time delay of availability of results
- Inability to convert as detail information is missing

Most applications replicate transaction data to be able to support the different accounting dimensions.

ADempiere was designed to support multiple accounting requirements. The concept of Set of Books was improved with the concept of Accounting Schema. An Accounting Schema is a combination of the following:

- Chart of Accounts
- Accounting standard
- Costing method
- Accounting currency

Note, that in contrast to a Set of Books, a Calendar is not directly part of an Accounting Schema, as multiple calendars per accounting schema may exist. The calendar is reduced to transaction support functions (open/close periods, summary postings, allocation definition and ease of entry).

In contrast to most other applications, ADempiere differentiates transaction and the resulting accounting consequences with the following benefits:

- transaction data is not replicated

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- an accounting schema can be added or discontinued at any time
- accounting information for historical transactions can be generated
- any attribute can be modified or replaced (and optionally the accounting regenerated)
- accounting schemas are easy to extend and maintain
- the system is error tolerant because it can be corrected and regenerated.

It is possible for customers to extend accounting rules (by programmed modifications), if the predefined accounting rules are not sufficient (internally, accounting rules are defined using an accounting rule engine). Additional accounting rules may be implemented to address such matters as commitment accounting.

14.5 Multi-Tax

ADempiere supports Sales Tax and Value Added Tax, including multiple taxes where a tax is charged based on say, a product cost plus a state based tax (e.g. for Canada). The tax engine determines the correct tax, its amount and date based on the following:

- Transaction time
- Product category
- Ship from/to location
- Invoice from/to location

14.6 Multi-Costing

Using different costing methods (Standard, Average) can result in different financial results. ADempiere supports using more than one costing method, e.g. for legal accounting and business decision-making.

ADempiere maintains the information for the following costing methods:

- Standard Costing
- Actual Costing (Average)
- FIFO
- LIFO

14.6.1 Standard Costing

In Standard Costing, the system maintains a standard cost and accumulates the differences between actual costs and standard costs over time. Due to changing prices, it is necessary to set new standard prices periodically. The new standard price can be set manually or from sources like:

- Current Average Price

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- Last PO
- Purchase Price list

When an item is received, it is posted with the standard cost price. When the matched invoice is posted, the difference between the standard price and the actual price is posted to a standard cost differences account. If product related credit memos or early payment discounts are received later, or realised currency gain/losses occur, these amounts are also posted to the cost difference account. The balance on that account reflects how closely the standard cost price matches the actual costs.

14.6.2   Actual Costing

The actual cost price is adjusted when products with changed costs are received.

When an item is received, it is posted at the actual cost price. If there is no current actual cost price, the standard cost price is used, or if that does not exist the purchase order price is used. When the matched invoice is posted, the difference between the cost price used and the actual price is posted and the costs are adjusted. If product related credit memos or early payment discounts are received later, or realised currency gains/losses occur, these amounts are also posted to the product account.

One major issue in actual costing is correcting the costs if the product has been sold before receiving the invoice. Presently, ADempiere does not retroactively adjust the costs used in the receipt and sales transaction, but adjusts the actual cost price for future use.

14.6.3   LIFO & FIFO Costing

With effect from the release of the enhanced product costing version, additional product costing options such as LIFO and FIFO will be supported together with the use of average costing for accounting purposes as well as the recording of averages as performed in earlier versions.

14.7   Multi Lingual

ADempiere provides for the translation of the following system elements:

- Screens
- Reports
- Messages
- Seed Data (e.g. status information like Open/Close, etc.)
- Transactions

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Many applications allow the translation of Screens, Reports and Messages, but few allow the translation of seed data and even fewer, the translation of transactions. Many do not provide the ability to switch language as a user of the system. ADempiere provides:

- System translatable in one (base) language
- User can decide, which language to use
- Create documents in the language of a customer or vendor.

Very few applications support this because it requires printing the translated word for 'Invoice' as well as providing for different address formats, description of products, etc. (see also Multi-Currency for business partner specific currency).

ADempiere allows users to translate all elements, allowing different users to have their screens and reports in their language and whilst allowing documents to be printed in the format and language of the customer or vendor. Dates and address formats are also printed in the format specified for the country of destination.

As the translation is dictionary based, the translation is much more consistent than other applications with different tool-sets for translating the different elements.

14.8 Structural Changes Midstream

After an application is in production or even during implementation, users often request changes in the information structure. There are many reasons for this need to change. During the use of the application, people realise that information is not needed or additional information is required for decision-making. Also, changes in the business may require the collection of additional information.

Most applications do not allow any change mid stream or alternatively a change requires the same effort as implementing the system from scratch.

ADempiere provides for the addition, change or deletion of information dimensions at any time. The underlying OLAP (Online Analysis Processing) structure is maintained automatically.

14.9 Information Dimensions and Trees

ADempiere provides an extensive list of predefined dimensions:

- Organisation
- Owning (balance sheet organisation)
- Cost Centre

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- Natural Account
- Date and Time
- Accounting
- Product and Product Category
- Business Partner and Business Partner Category
- Project / Phase / Task
- Marketing Channel
- Campaign
- Activity (for activity based costing)
- Location (Warehouse, Business Partner)
- From
- To

ADempiere allows the user to define additional dimensions. These dimensions can be validated via lists or table lookups.

All dimensions allow the definition of Trees. These summary levels allow the user to reflect the organisation structure or the balance sheet and income statement positions in a logical tree structure. Changes to the tree structure are possible at any time and are reflected in the data structures immediately.

Every information dimension has a primary tree and can have additional summary trees. This may be required if it is desired to maintain the 'old' and 'new' structure for comparison - or if it is necessary to support different parallel business partner hierarchies, e.g. one by Industry, another by category (wholesale, retail, consumer).

Many applications do not have the ability to structure information dimensions, which results in unnecessary data entry and overhead. For example: if a user wants information on branch and division levels and divisions are made up of branches, the user may have to enter the two fields branch and division and define rules, so that users cannot enter a wrong branch for a given division and vice versa.

14.9.1 Automatic Data Collection

Data entry needs to be as efficient as possible, which is equivalent to entering as few fields as possible. ADempiere provides a framework, which derives information automatically from the transaction context to min-imise the amount of data that the user needs to enter. Users can also select choices.

This is a significant advantage over other applications. For example, the Order Entry functionality is not usually 'aware' of the information needs of Customer Relationship functionality, this results in information that is not available or needs to be derived from existing data with subsequent loss of required detail.

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Getting the information right from the source is a tremendous benefit. But, if the information is not needed, the user is not asked.

14.9.2   Combination of Dimensions

For reporting purposes, the user can slice and dice any combination of information dimensions. For all transactions the source and accounting currency information is maintained in addition to unit of measure and quantity.

Users can view financial results by Business Partner and Region or Product Group and date or period.

14.9.3   'Sub-Ledgers' are not required

An accounting system is often defined as the combination of Chart of Accounts, Calendar, Currency, with implied accounting rules. ADempiere broadens that definition by storing the information on the lowest level of granularity (transactions). The transactions can be 'rolled up' to whatever level of granularity is required for any particular report because all underlying data is retained and available.

The information required for a business decision is often not found in traditional accounting systems, so additional data warehousing systems maintain parallel data to accommodate this need. ADempiere is based on a data warehousing architecture to allow flexible reporting.

ADempiere maintains both the accounting and transaction date. This is required for revenue recognition rules of service contracts or if the costs were for another period (eg. next year's rent), the accounting periods can be different. Reporting can be based on either view.

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15 Customisation and External Interfaces

15.1 Application Dictionary

In the majority of applications, the developers have to design, code and test every screen. ADempiere uses the more advanced concept of a central active data dictionary, also called information repository to simplify this task.

ADempiere's data dictionary is at the meta-data layer, and knows how to access data and how data is related. The data dictionary contains definitions of a data entity (type, validation, etc.), how it is displayed (label on screens and reports, help, display sequence and position relative to other fields), and the display rules. Security and access rules are also maintained here. The data dictionary is 'active', meaning it is used at runtime and context sensitive. For example: it 'knows' that an over-the-counter sale does not have a payment term and does not display it. It also knows that there must be stock available even if the inventory record shows zero (because, say, a material receiving has not been processed). However if the user changes the transaction type to a standard order, a payment term becomes a mandatory part of the transaction and the transaction recognises the out-of-stock situation.

The Data Dictionary is user-extensible and can include user specified rules and information. This enables authorised users to add new tables and new screens and additional fields to existing screens. All added items are automatically able to be listed and reported using the standard reporting functionality available throughout the whole application.

15.2 Customisation

In addition to ADempiere's ability to customise User Interfaces, Reports and Extensions, ADempiere provides additional customisation capabilities as follows:

- Preferences allow default and preselected choices
- Login preferences - Organisation, Language, Transaction Date and Printer
- User defined preferences, like specific transaction types.
- The Menu Bar allows the user to save any entry in the menu (Window, Process, Report) as a short-cut.
- Terminology can be changed. Eg change 'Products' to 'Items', 'Organisation' to 'Branch', etc.
- Help Text can be modified and extended by the user to provide hints and help texts.

Customisations are definable on different levels.

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- System or implementation wide
- Window, where appropriate (e.g., for preferences)
- Client
- Organisation
- Specific User

More specific levels overwrite the settings of more general levels. System level changes are automatically saved and can be defined as customisations if required and reapplied after the installation

15.3 Functional Integration

ADempiere fully integrates Enterprise Resource functionality with Customer Relationship functionality and Analytical Processing. This tight integration ensures that the different functional areas have all the information required for business decision-making. There is no need to derive information as everything is based on the source transaction.

Many applications do not provide full functional integration. In ADempiere entering or viewing project information in transactions does not require additional steps. When exceptions occur such as vendors owing money or customers requiring refunds, ADempiere treats these without additional overhead.

15.4 Interfaces

15.4.1 Business Views

If the internal reporting facilities are not sufficient, third party SQL based tools can be used. ADempiere provides business views which resolve all foreign key references and are therefore 'ready to use'. There is no need for data model knowledge or the development and maintenance of catalogues for the use of third party tools.

15.4.2 Data Export

ADempiere exports all data in reports to the following data formats:

- Excel
- HTML
- XML
- Text
- PDF

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- PS
- Business OLAP Cubes

ADempiere allows exporting of OLAP data to Excel Pivot tables and selected OLAP tools for further analysis.

15.4.3 Data Import

ADempiere imports data from a variety of file types (CSV, Tab etc). There are predefined formats, but users can also define their own record formats.

15.5 Extensions

In addition to the internal application dictionary based customisation capability, ADempiere also provides the ability to extend the application. In contrast to other applications, client extensions are possible in a hosted environment and are maintained during upgrades.

15.5.1 Information Structure

If the information structure is not sufficient, users can add fields to any record with its presentation and validation rules. Data entry can be made mandatory, if certain conditions apply. The entry validation can be based on lists, tables or functions like callouts.

15.5.2 Scripting

ADempiere Scripting allows the user to extend the functionality using JSR223 scripting syntax. See http://www.adempiere.com/index.php/Script_Callout for further information.

15.5.3 Call-out

Functional extensions are implemented via 'callout' technology. Clients can provide additional functionality in Java or even native C functionality, e.g. for additional validation or data feeds. Callouts can be invoked before or after data entry in any field. ADempiere ensures that callouts cannot crash or corrupt the system.

15.5.4 Rules

The advanced user can extend and in certain areas modify the rule base. Rules are organised in packets making sure that transaction integrity is maintained. Rule extensions could be used for generating statistical entries or special reporting needs.

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Currently, rules are used for creating accounting transactions and for pricing.

15.5.5 Web Services

ADempiere provides native web services support that allows soap calls to be defined directly within the application. ADempiere directly manages security and access control and thus allows safe access by third party provided applications to the ADempiere system.

15.6 e_Commerce

15.6.1 XML, OAGIS and OFX

ADempiere provides interfaces according to the OAGIS (Open Applications Group Integration Specification). The interfaces are implemented in XML or via Interface Tables.

The Open Applications Group is a non-profit consortium focusing on best practices and processes based on XML content for eBusiness and Application Integration. It is the largest publisher of XML based content for business software interoperability in the world. Open Applications Group, Inc. members have over 5 years of experience in building this industry consensus based framework for business software application interoperability and have developed a repeatable process for quickly developing high quality business content and XML representations of that content. Members include SAP and Oracle.

ADempiere supports OFX (Open Financial Exchange) transactions. Open Financial Exchange is a unified specification for the electronic exchange of financial data between financial institutions, business and consumers via the Internet. Created by CheckFree, Intuit and Microsoft in early 1997, Open Financial Exchange supports a wide range of financial activities including consumer and small business banking, consumer and small business bill payment and bill presentment.

15.6.2 EDI / EDIFACT

ADempiere supports EDI and EDIFACT. Please refer to the Adaxa How-To guide for details of how it is implemented and used in a test case.

The document is accessible from: https://docs.google.com/a/adaxa.com/folder/d/0B3bIqlUcP8L-ccElYY25nNkNCMlU/edit?docId=0B3bIqlUcP8LcMnJEUWg2cGlyejg

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15.6.3 Data Import

ADempiere provides interfaces according to the OAGIS (Open Applications Group Integration Specification). The interfaces are implemented in XML or via Interface Tables.

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16 Integration with Other Systems

16.1 Integration Options
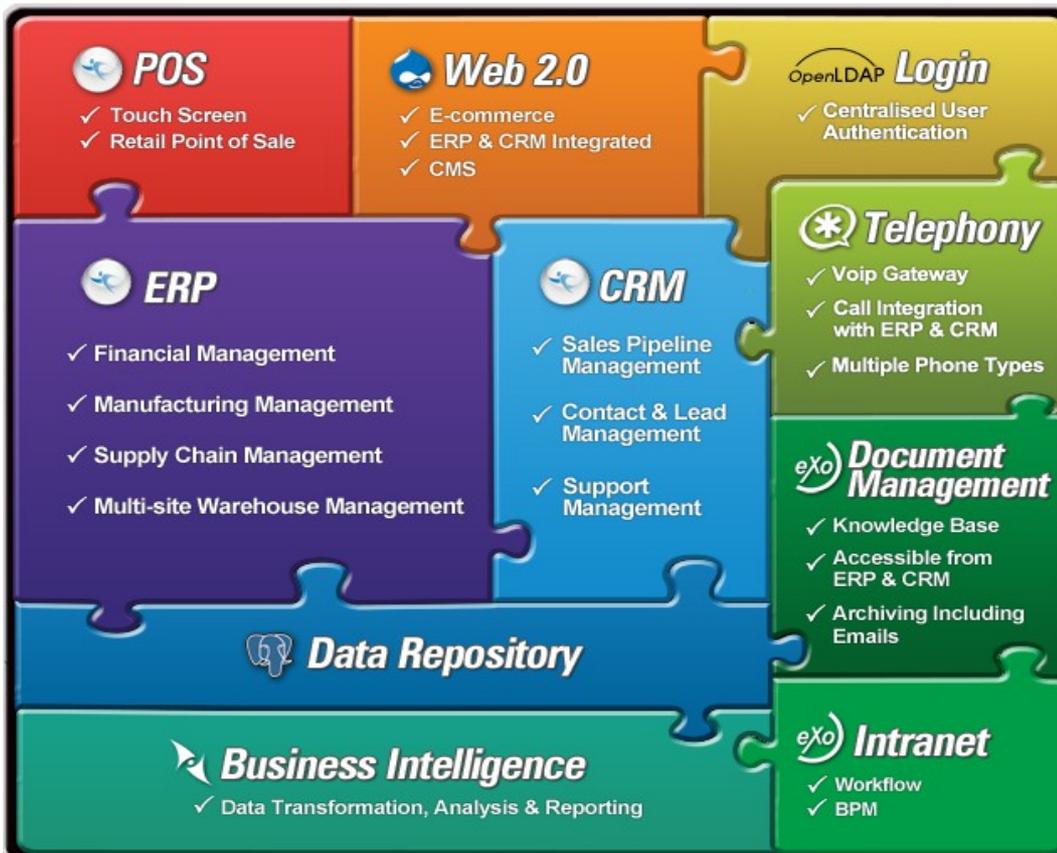
ADAXA has integrated ADempiere with other systems typically required in medium sized enterprises. The products which we have selected for integration are the best of the available "true open source" offerings that we could find at the time of integration. By "true open source" we mean products that have source code published for the fully featured version of their product without a requirement that the user enters a proprietary style software licence in order to access important functionality and for which FULL documentation is available to ensure that integration can be successful and effective.

It is ADAXA's "true open source" requirement that has precluded a number of well known offerings which advertise themselves as open source but when pressed state that they are "open core" rather than "open source".

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The risks of of this from a user's perspective are well explored in an article at http://www.h-online.com/open/features/The-Open-Source-Enterprise-Trap-746559.html.

16.2 The Adaxa Suite

ADAXA has integrated the following products with ADempiere. The integrated group of products is referred to by us as the 'ADAXA Suite'.

16.3 Website and Webstore

ADempiere can be deployed in conjunction with the Drupal Content Management system (CMS). Drupal provides a much more feature-rich website than is displayed by the standard ADempiere webstore. The CMS capabilities allow the user's staff to directly modify and update the information displayed in the user's website without involving any code changes.

Please see the following link for further information about Drupal:

● http://drupal.org

Drupal has a number of e-Commerce plug-ins that can be deployed in a Drupal-hosted website. Additionally ADAXA has built its own e-Commerce module now named Egility which is directly integrated with ADempiere using ADempiere's native webservices. The integration allows Egility to act as a presentation layer for the ADempiere ERP system so that all e-Commerce data is created and maintained directly in the ERP system rather than be created in the webstore and then propagated by some method into the ERP system.

Please see the following link for further information about Egility:

● http://www.egility.biz

16.4 Document Management

ADempiere can optionally be integrated with eXO Platform document management system. The eXO Platform system allows documents to be stored and indexed so that right-click functionality in ADempiere windows can automatically search the document management repository for documents and notes related to the matter in context in the ADempiere window/field. [Note that eXO does have some commercially licensed optional com-ponents however those components used in the Adaxa Suite are fully open source]

Please see the following link for further information:

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- http://community.exoplatform.org/portal/public/classic/home

16.5 Intranet

The user's Intranet can be built and deployed using eXO platform. Because eXO is java based it is possible to expose components of the ADempiere functionality directly in the Intranet to allow easy web-based access to ADempiere functions. Note that some eXO functionality in this area is closed source. Another option is to utilise Drupal to provide the user's Intranet should that be preferred.

16.6 Email Integration

An SMTP agent can be deployed in conjunction with the User's preferred email system that captures all incoming and outgoing emails. All emails (based on some rules) are added automatically to the document management system and indexed and are also available to be searched from within the ERP system using right-click functions available in all windows.

Please visit the following links for further information:

- http://www.inovox.de/products/e-mail-archiving/e-mail-archiving, and
- http://www.postfix.org

The user can also choose to deploy Postfix as their email server if they have not already deployed an alternative application.

16.7 Telephony

The ERP system "knows" all employees, customers, suppliers and the contacts within those organisations.   If an incoming telephone call is able to be identified in a call being handled by an Asterisk switchboard, then the contact information, the switchboard number called and details of all recent interactions with the contact can be displayed on the answering parties screen. These details will also appear on the screen of any other employee to whom the call is transferred.

Please visit the following link for further information (NOTE - the call transfer function is not in standard Asterisk):

- http://www.asterisk.org

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16.8 Business Intelligence and Data Warehousing

The ERP system can 'feed' a Business Intelligence System like Spago BI or Pentaho and automatically provide extended views of the data within the ERP system or views of data from other external systems optionally combined with data from the ERP System.

Please visit the following links for further information:

● http://spagobi.eng.it/ecm/faces/public/guest/home/solutions/spagobi, and
● http://www.pentaho.com

16.9 Access Control

LDAP authentication can be used so that all systems authenticate against a single dataset of user information populated from the User table maintained from inside ADempiere.

Please visit the following links for further information:

● http://www.openldap.org, and
● https://blogs.oracle.com/praneet/entry/opends_and_adempiere_integration_a

16.10 Point of Sale

ADempiere contains a java-based point of sale that is effective where communications back to the centra ADempiere server are able to be relied upon. Where communications are not reliable, or where there is a preference to be able to disconnect the POS system from the ADempiere server, it is possible to to deploy SmartPOS Advanced Point of Sale. "SmartPOS is an advanced Point of sale improved upon present openbravo POS, while integrated (slave) to Idempiere ERP (1.0.c) using an asynchronous approach (RabbitMQ using AMQP). It is optimized to be secure, reliable with focus in productivity and fraud control".

Further details are available at

http://sourceforge.net/projects/smart-pos/?source=navbar

-end-

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17 ADempiere Community

17.1 An Open Source Project needs a strong community

A strong and vibrant community is essential for the success of an open source project. It is the community that frequently provides free support for the application and it is members of the community scratching their own personal software "itch" that is the source of many improvements contributed back to the application. An open source project without a strong community is basically doomed and is something to be steered clear of.

The ADempiere project is hosted on Sourceforge. As of February, 2012, more than 320,000 software projects have been registered to use Sourceforge's services by more than 3.4 million registered users, making Source-Forge.net the largest collection of open source tools and applications on the net. Until Sourceforge stopped displaying such information the ADempiere project was typically in the top 5 of most active projects on the Sourceforge repository.

17.2 Recent ADempiere Improvements

One measure of project activity is the number of extensions and improvements that are being contributed by community members. On this measure ADempiere is particularly active. The following is a list of the major changes and improvements in ADempiere from the time of the fork from Compiere around September 2006. The list was prepared by Carlos Ruiz who is a major contributor to the ADempiere project and, until recently, the head of the Project Management Committee. The list if of technical enhancements and ignores functional enhancements.

- FULL Postgresql support for the open source Postgresql version (not EnterpriseDB proprietary version)
- FULL Oracle XE support
- FULL jasper integration (for common reports, documents and financial reports)
- FULL support of free PDF and XLS generation
- Easy installers for windows and linux
- Able to save attachments and archives in filesystem (to lower DB resources i.e. for oracle XE)
- Many performance enhancements
- VMWare appliances
- Open Migration Path
- Centralized ID management for official dictionary and migration script generation
- Migration from Oracle to Postgresql using ddlutils

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- Extensibility with script languages for callouts, model validator, processes using beanshell, jython, groovy
- Ease application of patches for maintained versions
- Web Services layer following the dictionary model
- SaaS to enable custom enhancements in multi-tenant architecture
- Published localisations for many countries (Colombia, Germany, Indonesia, Italy), some localisations achieved without touching core because of the extensibility improvements in ADempiere
- Better management of multiple scenarios (test, development, production) allowing to pass dictionary changes between installations with 2pack
- Complete web client using ZK (with all functionality of swing client respecting totally the active dictionary approach) - java callouts are developed just once
- Lots of new events on model validator (extending the concept to something close to AOP), for example you can modify the posting of a document
- Working on OSGI improvements
- Working on automated tests with Fitnesse, SAHI, Selenium
- Replication
- Many dictionary improvements like: system configurator (implementation preferences), user preferences, house keeping, better change audit, configurable use of native DB sequences, shortcuts, global model validators, new field group types, allow more than two columns of fields in windows.

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DOCUMENT SUMMARY SHEET

Client:	
Title of Document	
Summary: *(Brief description of document)* This document contains an overview of the ADempiere ERP & CRM system for the sole purpose of enabling the target audience to gain an understanding of the functionality and architecture of ADempiere ERP & CRM system. It is not warranted that this document is error free.	
Indexing Terms: (Keywords)	

Work Carried Out By: (Team initials or names)	**ADAXA Reference:** **n/a**

DOCUMENT REVISION RECORD

File Name	Rev No.	Issue Date	Reason for Issue
ADempiere ERP & CRM Booklet 2013-04 v2.odt	1.2	27/04/2013	revision

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