



Lisbon School
of Economics
& Management
Universidade de Lisboa



Carlos J. costa

ERP

ENTERPRISE RESOURCE PLANNING

(2021 version)



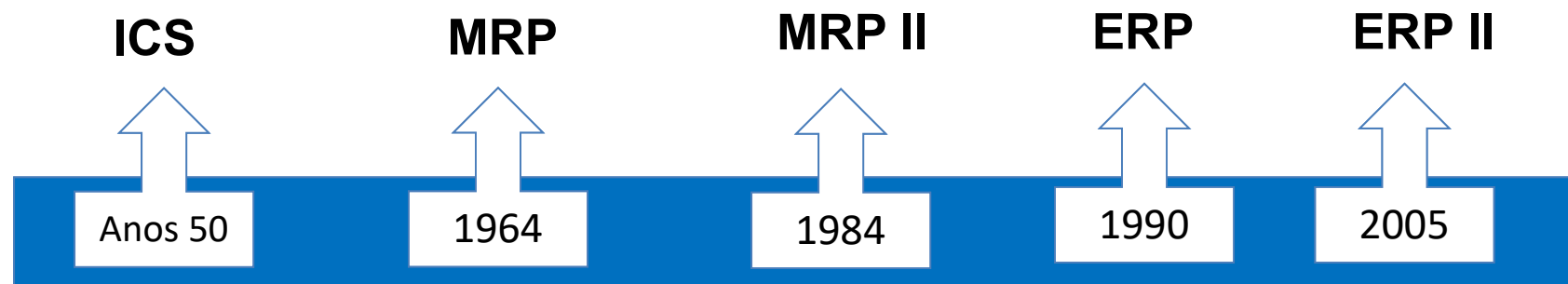
Carlos J. Costa (ISEG)

Agenda

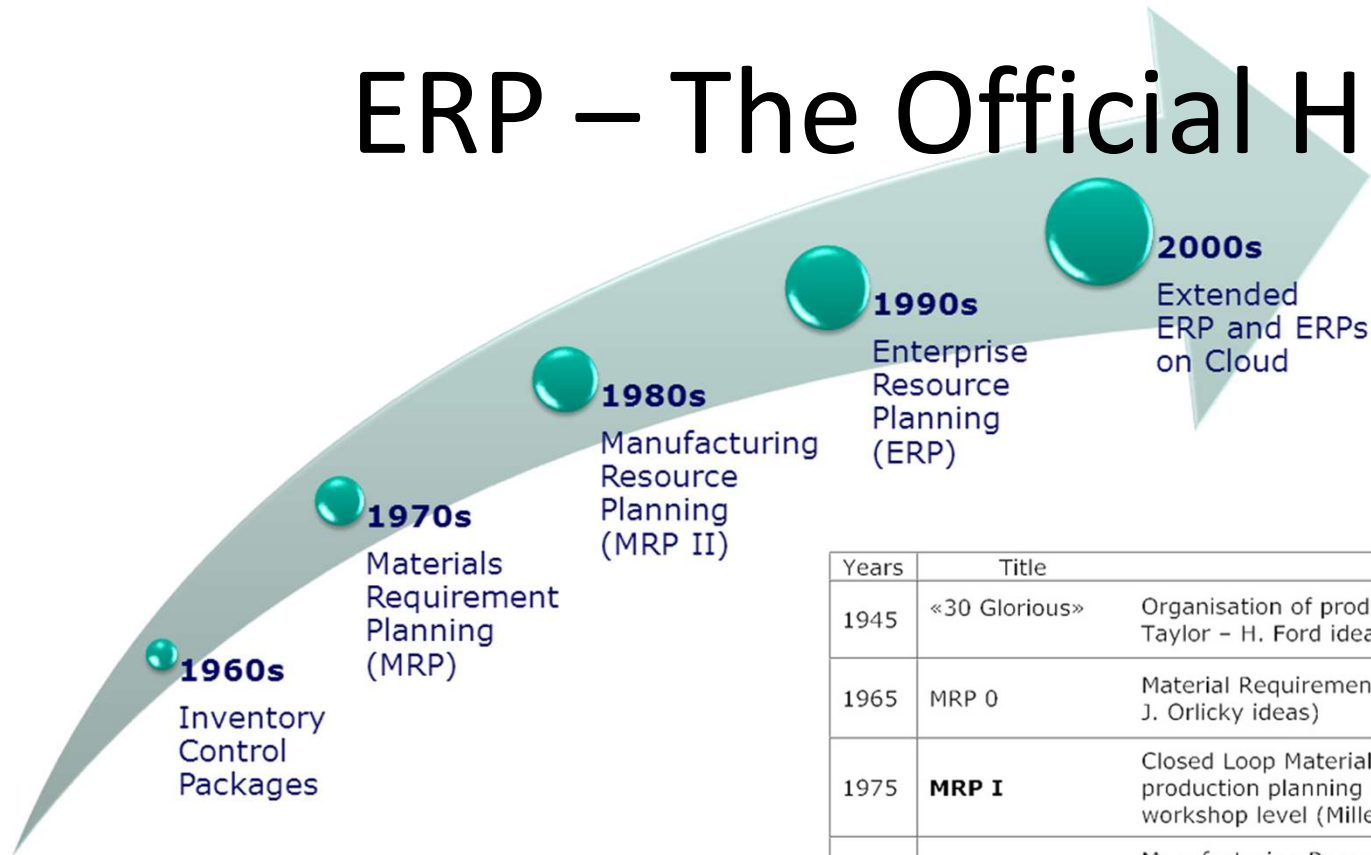
- ERP- The official history
- ERP concept
- ERP- Integrated System
- Advantages to management
- ERP Architecture
- Market
- Open Source
- Law and Tax Issues

ERP – The Official History

- ICS- Inventory Control Systems
- MRP – Material Requirement Planning
- MRP II – Manufacturing Resource Planning
- ERP – Enterprise Resource Planning
- ERP II- Enterprise Resource Planning II



ERP – The Official History



Years	Title	Main features
1945	«30 Glorious»	Organisation of production principles (based on F.W. Taylor – H. Ford ideas)
1965	MRP 0	Material Requirements Planning (based on O. Wight – J. Orlicky ideas)
1975	MRP I	Closed Loop Material Requirement Planning, setting of production planning and its execution control on workshop level (Miller-Spreague)
1980	MRP II	Manufacturing Resource Planning based on data from suppliers and customers. Forecasting, planning and production controlling.
1985	MRP II+	Implementing of JIT (Just in Time) concept, weak spot optimisation
1990	ERP	Enterprise Resource Planning, Materials Planning, Order Entry, Distribution, General Ledger, Accounting, Shop Floor Control
1996	Extend ERP	Scheduling, Forecasting, Capacity Planning, e-Commerce, Warehousing, Logistics
2001	ERP II	Project Management, Knowledge Management, Workflow Management, Customer Relationship Management, Human Resource Management, Portal Capability, Integrated Financials

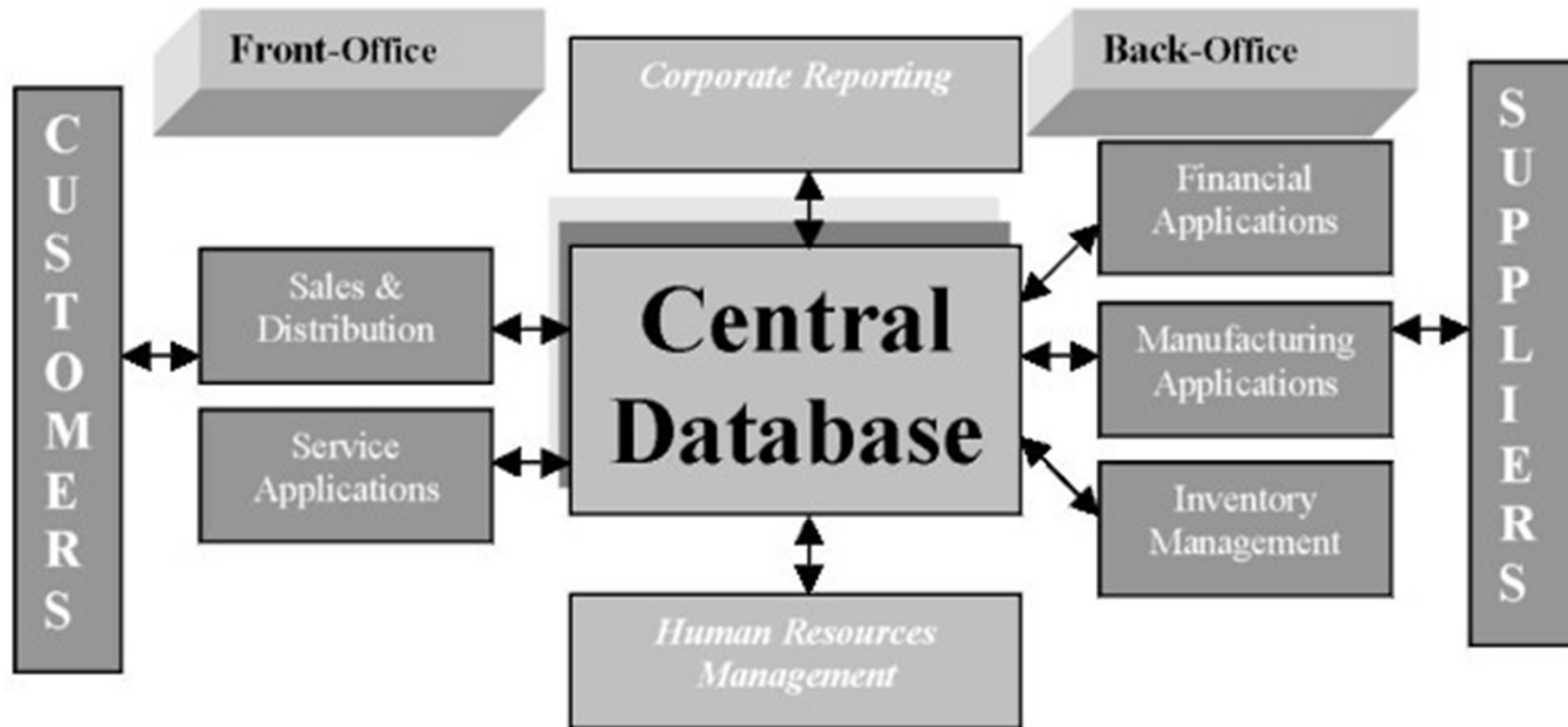
Concept

- *Enterprise Resource Planning*
- Set of very integrated programs
- Information is introduced just once in the system
- Allows integration of information and processes supported in information
- Is supported in DBMS
- Customizable

Concept

- Davenport (1988), presented the architecture of a ERP.
- In the center it is database with data from all the modules.
- Each module supports a functional area (Davenport, 1998).

ERP Architecture



(Davenport, 1998)

ERP as Integrated System



ERP II

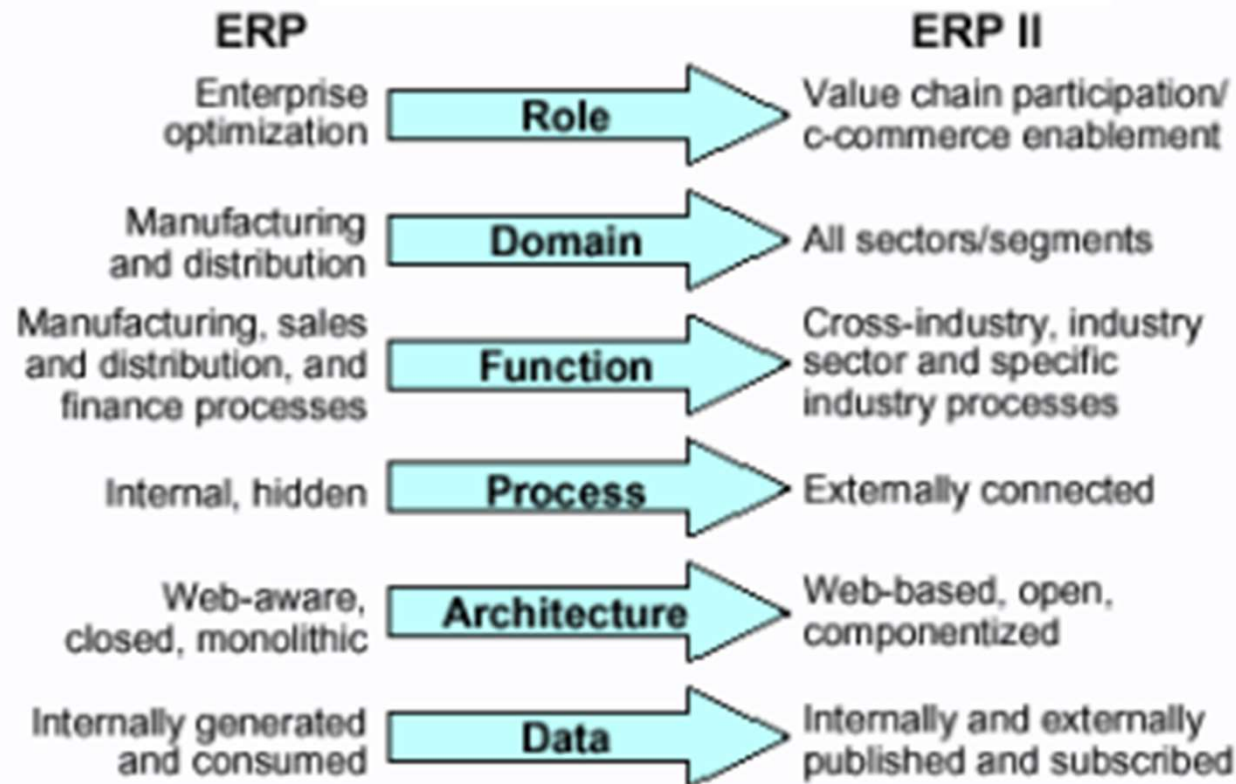
- ERP II is a transformation of ERP into a new generation of enterprise systems.

(Møller, 2005)

- Collaborative tools, (e.g. social networks) available in Web 2.0, have the potentiality to improve business processes and should be considered in the ERP II.

(Grabot, Mayere, Lauroua, & Houe, 2014)

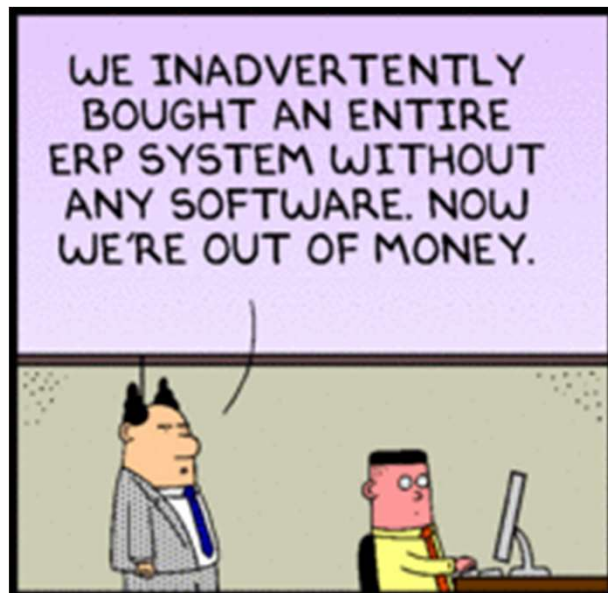
ERP II



Source: Gartner Research

Advantages of ERP

- Support business growth
- Change Legacy systems
- Improve business processes
- Reduce maintainance
- Reduce administrative Costs
- Prevent input of redundact data
- Decrease stoks maintance costs
- Decrease data entrance errors
- Multi currency systems are possible
- Decrease system operation costs
- Prevent delays and error in client orders
- Integrate applications
- Standardize processes



www.dilbert.com scottadams@aol.com



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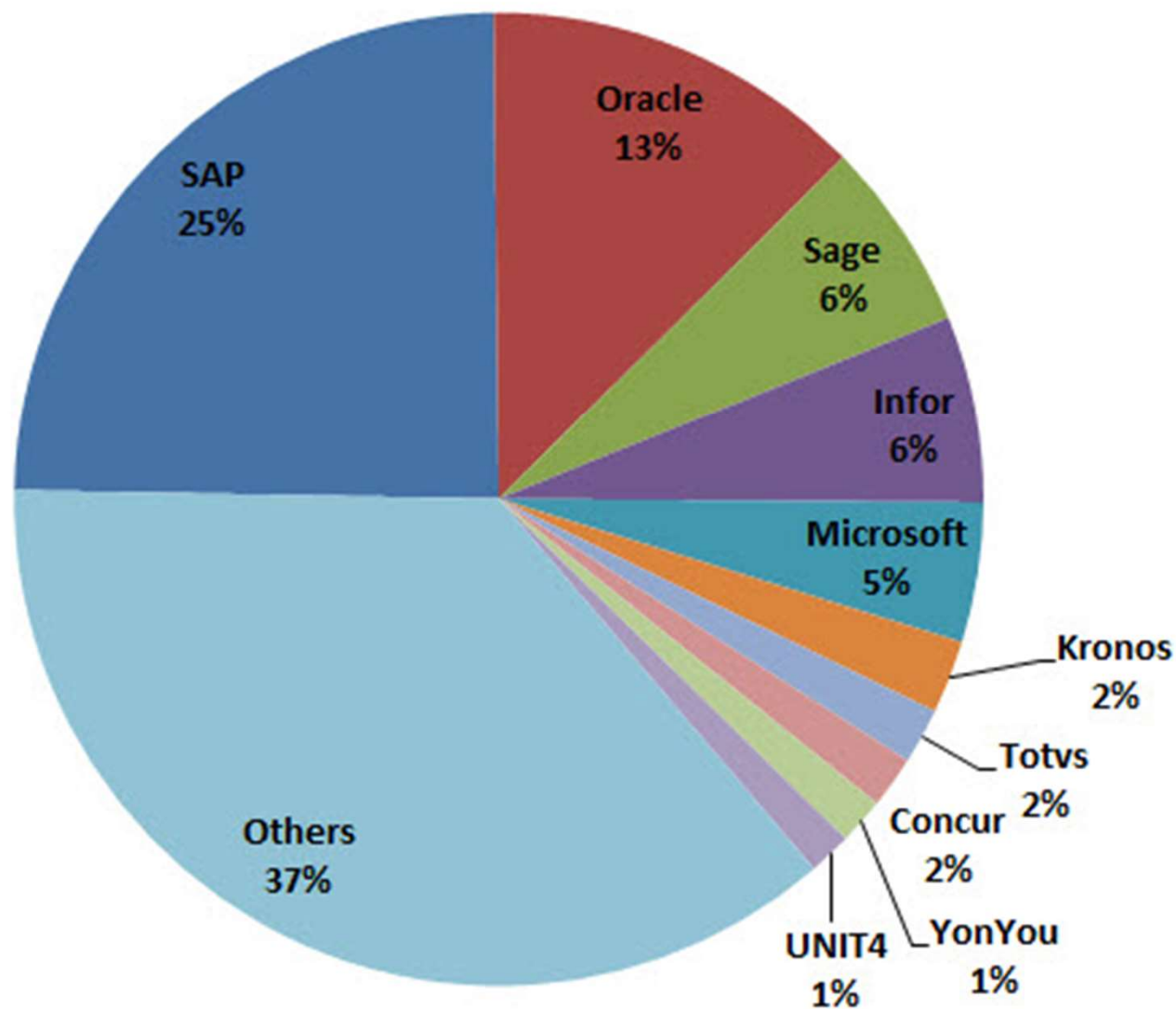


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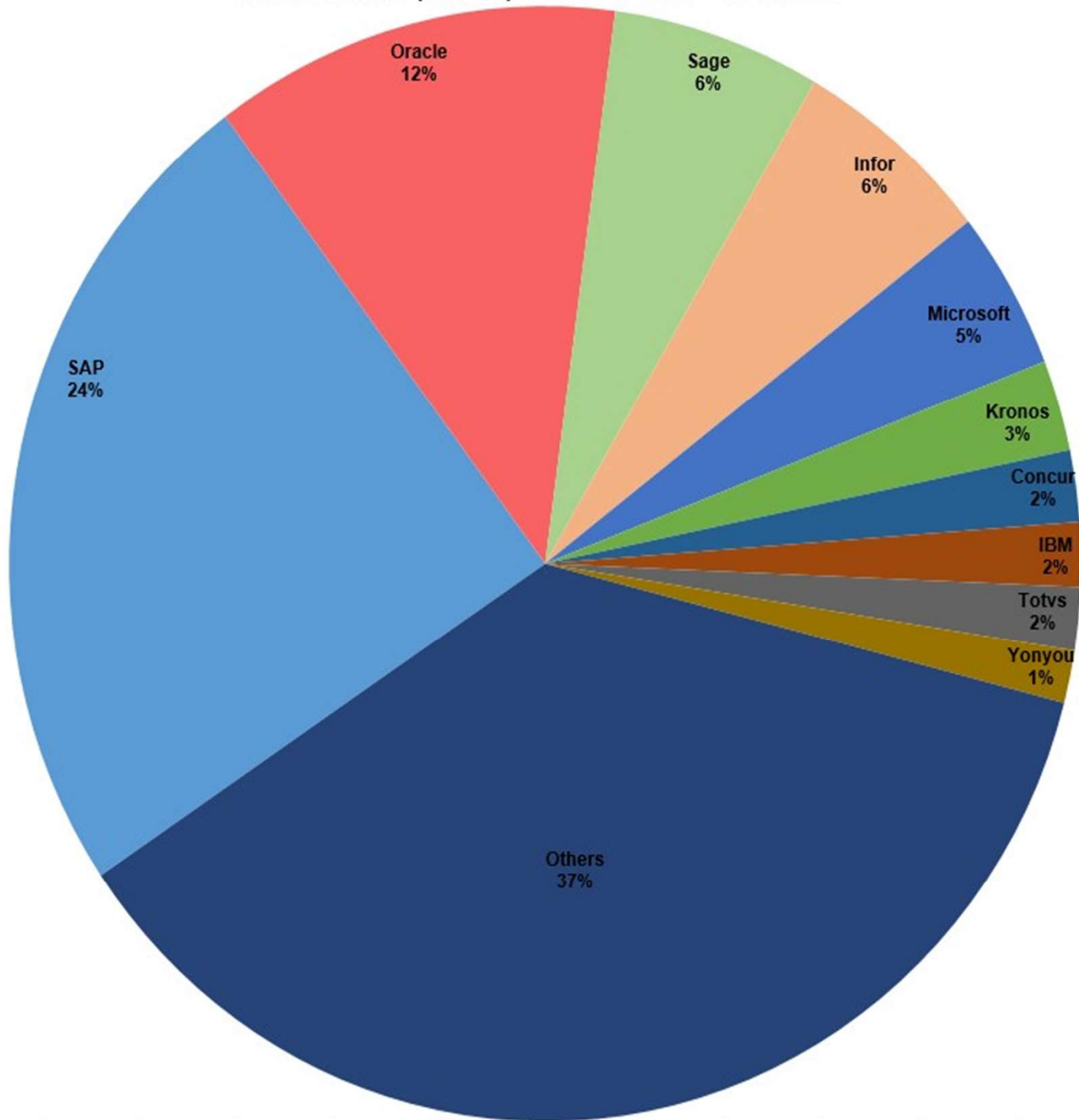
Worldwide ERP Software Market Share, 2012

Market Size: \$24.5B; 2.2% Growth Over 2011



Worldwide ERP Software Market Share, 2013

Market Size: \$25.4B, 3.8% Growth Over 2012



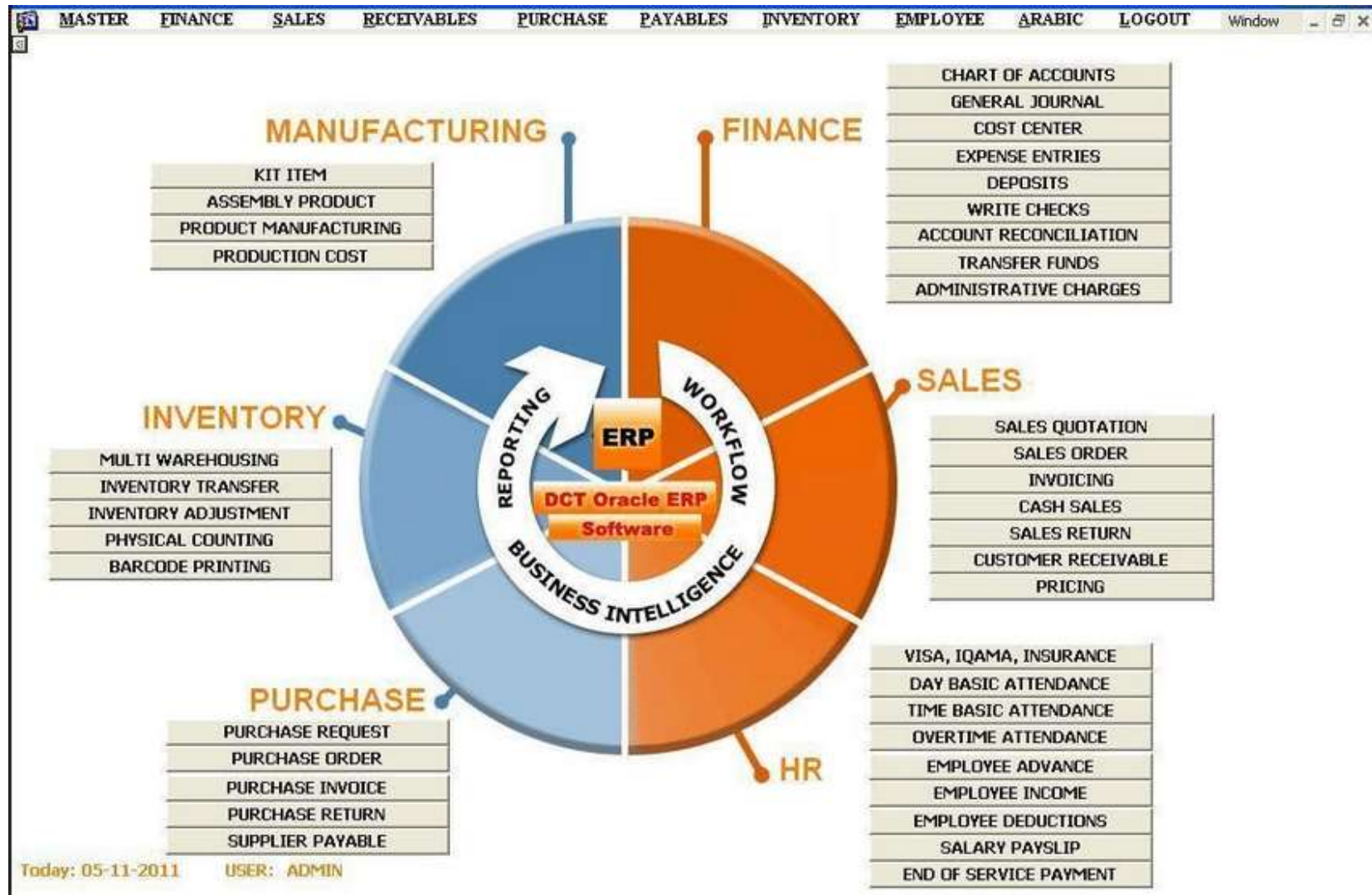
Firms



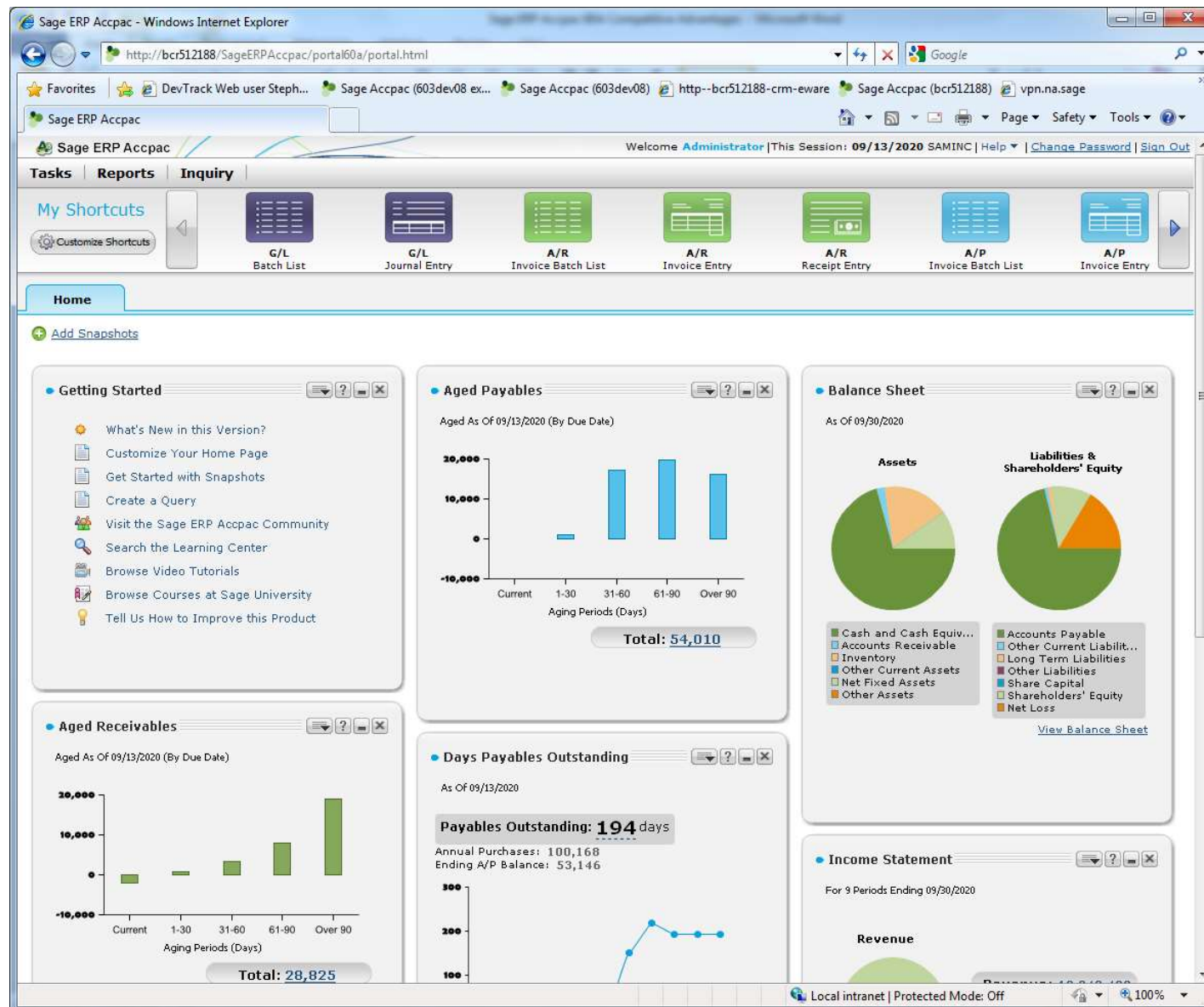
SAP

	Self Services							
Analytics	Strategic Enterprise Management		Financial Analytics		Operations Analytics		Workforce Analytics	
Financials	Corporate Governance		Financial Accounting		Management Accounting		Financial Supply Chain Management	
Human Capital Management	Employee Relationship Management		Employee Lifecycle Management		Employee Transaction Management		Workforce Deployment	
Operations: Value Generation	Purchasing	Inventory Management	Manufacturing		Distribution	Sales Order Management	Service Order Management	
Operations: Support	Product Structure Management		Project Management		Quality Management		Asset Management	
Corporate Services	Travel Management		Environment, Health & Safety		Incentive and Commission Management		Real Estate Management	
Solution and Integration Platform	People Integration		Information Integration		Process Integration		Application Platform	

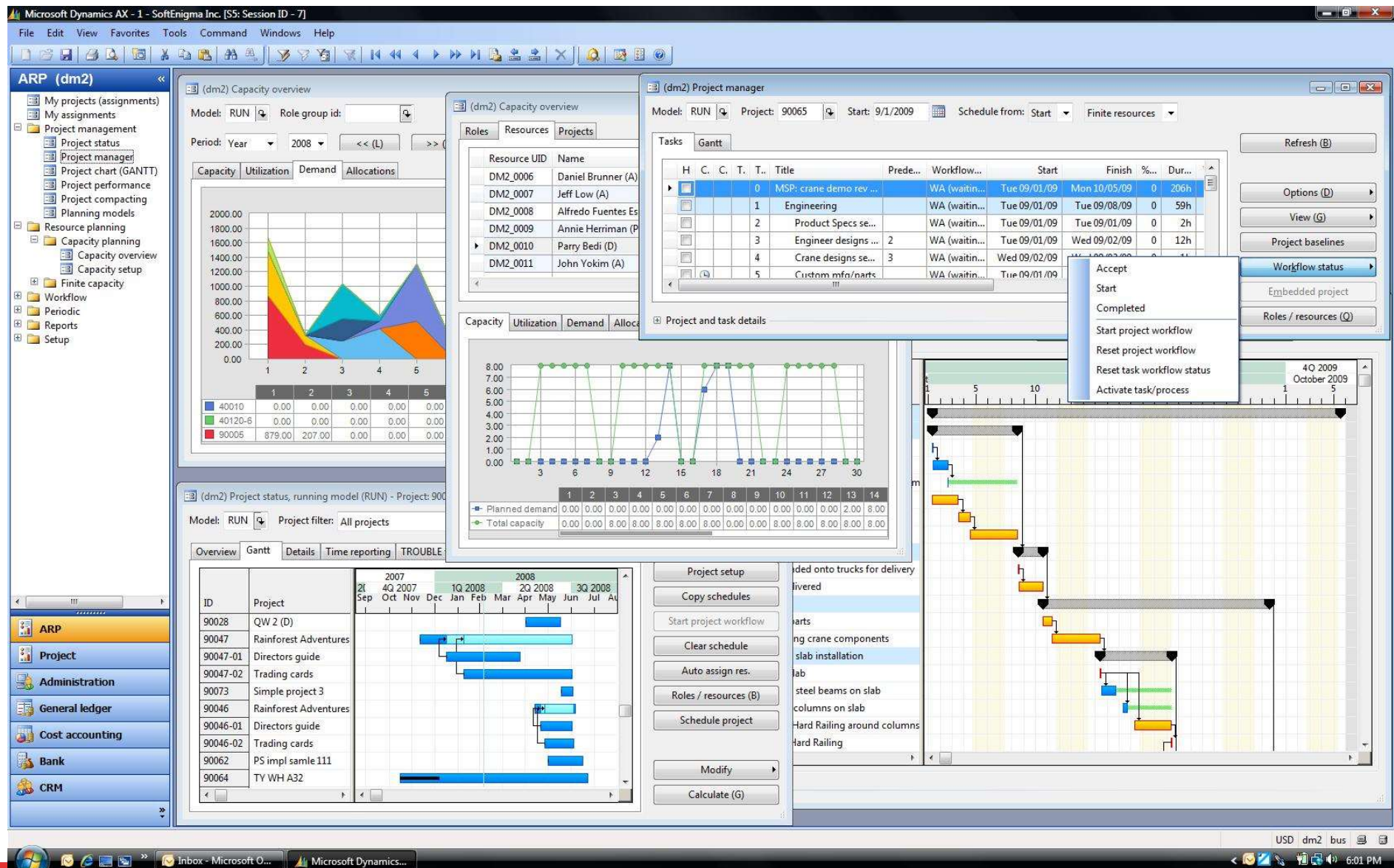
ORACLE



SAGE



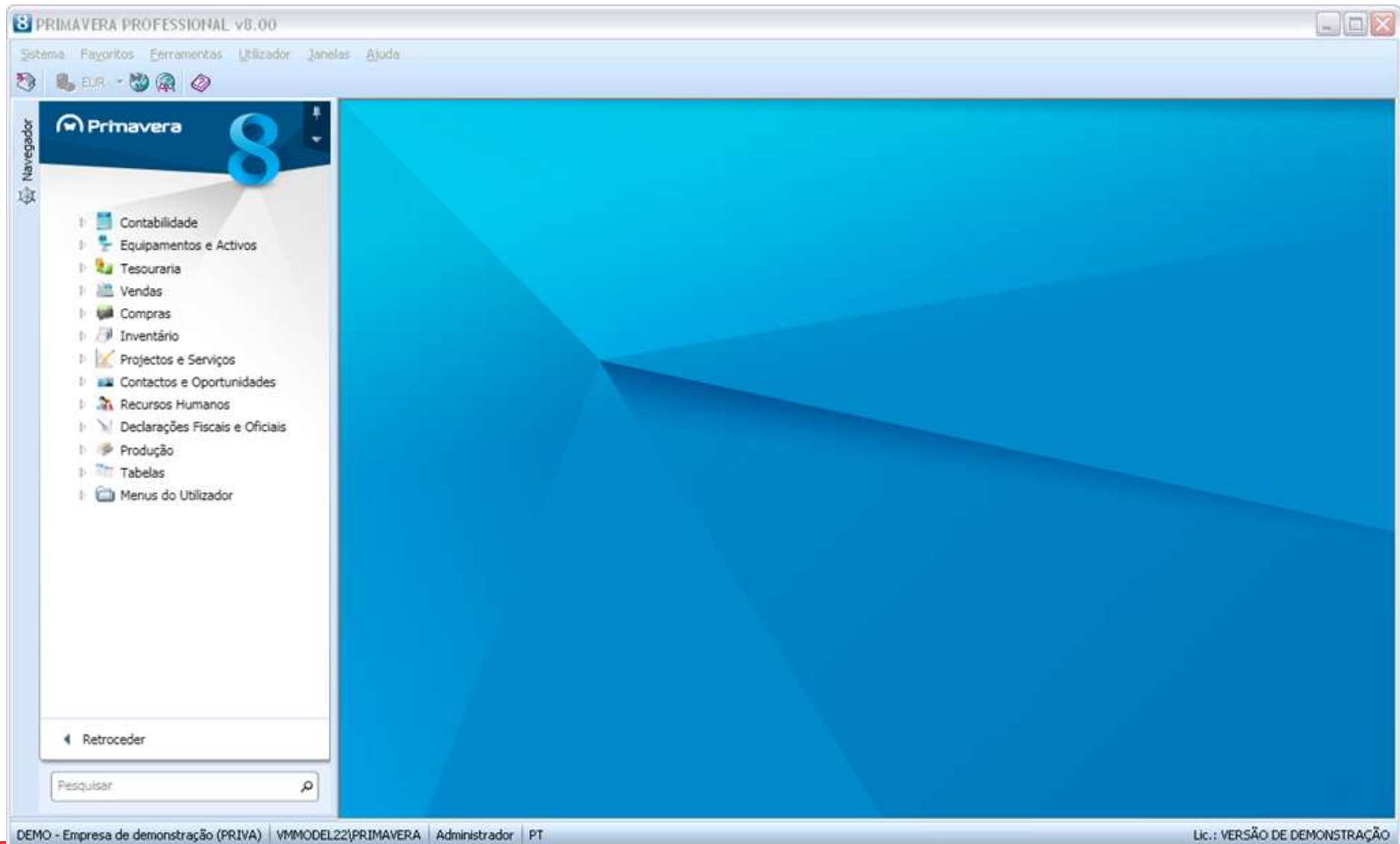
Microsoft Dymamics



National Market



Primavera



PHC



Open Source

odoo

Dolibarr^{ERP/CRM}

openbravo[®]

Tryton

ERP5

COMPIERE

ofbiz[™] The Apache Open for Business Project



webERP

+ erpnext



FrontAccounting^{ERP}

Kwa
Moja

WEBERP

The screenshot displays the webERP software interface. At the top, the user is logged in as 'Demonstration user' with the username 'weberpdemo'. The navigation bar includes links for 'Main Menu', 'Customers', 'Items', 'Suppliers', 'Manual', and 'Logout'.

The **Main Menu** is located on the left side, listing various modules: Sales, Receivables, Payables, Purchases, Inventory, Manufacturing, General Ledger, Asset Manager, Petty Cash, Setup, and Utilities.

The main content area is divided into three columns:

- Transactions** (icon: calendar and document):
 - Enter An Order or Quotation
 - Enter Counter Sales
 - Print Picking Lists
 - Outstanding Sales Orders/Quotations
 - Special Order
 - Recurring Order Template
 - Process Recurring Orders
- Inquiries and Reports** (icon: pie chart):
 - Order Inquiry
 - Print Price Lists
 - Order Status Report
 - Orders Invoiced Reports
 - Daily Sales Inquiry
 - Sales By Sales Type Inquiry
 - Sales By Category Inquiry
 - Top Sellers Inquiry
 - Order Delivery Differences Report
 - Delivery In Full On Time (DIFOT) Report
 - Sales Order Detail Or Summary Inquiries
 - Top Sales Items Report
 - Worst Sales Items Report
 - Sales With Low Gross Profit Report

Below the list, there are two sections:

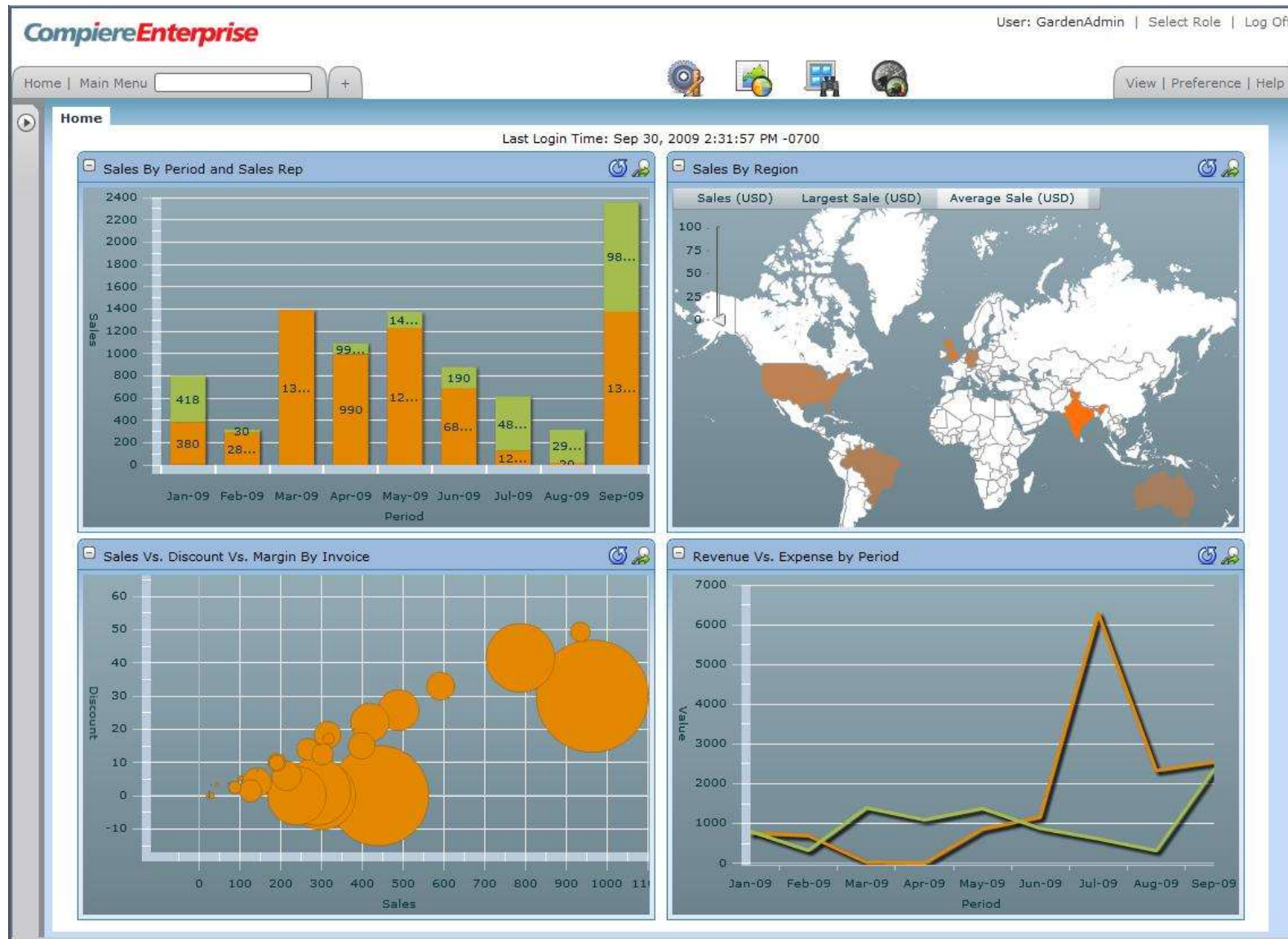
 - Standard Reports and Forms**: There are no reports to show!
 - Custom Reports**: There are no reports to show!
- Maintenance** (icon: wrench and gear):
 - Select Contract
 - Create Contract

At the bottom left is the 'webERP' logo. The footer text reads: 'webERP version 4.09 Copyright © 2004 - 2012 weberp.org'. The date and time on the bottom right are 'Saturday 6 October 19:11'.

OpenBravo

The screenshot displays the OpenBravo web application interface. The top navigation bar includes the 'yourCOMPANY' logo, a breadcrumb trail for 'Sales Management > Analysis Tools > Sales Dimensional Report', and the 'powered by openbravo' logo. A left-hand sidebar contains a tree view of the application's menu, with 'Sales Management' and 'Sales Dimensional Report' highlighted. The main content area is titled 'Sales Dimensional Report' and contains several sections: 'Primary Filters' with date pickers (set to 31) and a 'Comparative Report' checkbox; 'Secondary Filters' with dropdowns for Organization, Business Partner Group, Business Partner, Warehouse, Product Group, Product, Commercial Document, and Commercial File; 'Dimensions' with a list of dimensions (Business Partner Group, Business Partner, Product Group, Product, Documentno) and a corresponding empty input field; 'Sort' with radio buttons for 'Standard' (selected), 'By Ascending Amount', and 'By Descending Amount'; and 'View Results' with buttons for 'HTML Format' and 'PDF Format'. A red error message '* This value is required.' is visible next to the 'Amount Greater Than' field.

Compiere



FrontAccounting

The screenshot displays the FrontAccounting web application interface. At the top, there is a navigation bar with tabs for Sales, Purchases, Items and Inventory, Manufacturing, Dimensions, Banking and General Ledger, and Setup. The Setup tab is currently selected. Below the navigation bar, the user is logged in as Administrator on localhost. The main content area is titled 'Company Setup' and is divided into two columns. The left column contains links for Company Setup (highlighted), User Accounts Setup, Access Setup, Display Setup, and Forms Setup. The right column contains links for Taxes, Tax Groups, Item Tax Types, System and General GL Setup, Fiscal Years, and Print Profiles. Below the Company Setup section is a 'Miscellaneous' section with links for Payment Terms, Shipping Company, Points of Sale, Printers, and Contact Categories. The bottom section is titled 'Maintenance' and contains links for Void a Transaction, View or Print Transactions, Attach Documents, System Diagnostics, Backup and Restore, Create/Update Companies, Install/Update Languages, Install/Activate Extensions, Install/Activate Themes, Install/Activate Chart of Accounts, and Software Upgrade. The footer shows the date and time: 06/10/2011 | 06:17 pm.

Sales Purchases Items and Inventory Manufacturing Dimensions Banking and General Ledger **Setup**

Monkeypantz | localhost | Administrator Preferences Change password Logout

Company Setup

- **Company Setup**
- User Accounts Setup
- Access Setup
- Display Setup
- Forms Setup
- Taxes
- Tax Groups
- Item Tax Types
- System and General GL Setup
- Fiscal Years
- Print Profiles

Miscellaneous

- Payment Terms
- Shipping Company
- Points of Sale
- Printers
- Contact Categories

Maintenance

- Void a Transaction
- View or Print Transactions
- Attach Documents
- System Diagnostics
- Backup and Restore
- Create/Update Companies
- Install/Update Languages
- Install/Activate Extensions
- Install/Activate Themes
- Install/Activate Chart of Accounts
- Software Upgrade

06/10/2011 | 06:17 pm

ADempiere

The screenshot shows the ADempiere web interface in a browser window. The address bar shows the URL <http://www.testadempiere.com/webui/>. The user is logged in as 'SuperUser@System.*'. The interface has a menu bar with 'Menu (10)', 'Window, Tab Field', and 'Table and Column'. The 'Table and Column' tab is active, showing configuration for the 'AD_AccessLog' table. The configuration includes fields for 'Client' (System), 'Organization' (*), 'DB Table Name' (AD_AccessLog), 'Name' (Access Log), 'Description' (Log of Access to the System), and 'Comment/Help'. There are checkboxes for 'Active' (checked), 'View' (unchecked), 'Records deleteable' (checked), and 'High Volume' (unchecked). There are also dropdowns for 'Data Access Level' (System+Client), 'Window' (Access Audit), and 'PO Window'. A 'Create Columns from DB' button is visible. Below the configuration, there is a 'Column' section with a table listing columns for the 'AD_AccessLog' table.

Client	Organization	Table	DB Column Name	Column SQL
System	*	AD_AccessLog_Ac...	AD_Column_ID	
System	*	AD_AccessLog_Ac...	AD_Client_ID	
System	*	AD_AccessLog_Ac...	AD_Column_ID	
System	*	AD_AccessLog_Ac...	AD_Org_ID	
System	*	AD_AccessLog_Ac...	AD_Table_ID	
System	*	AD_AccessLog_Ac...	Created	

ERPNext



Invoice software certification (Portugal)



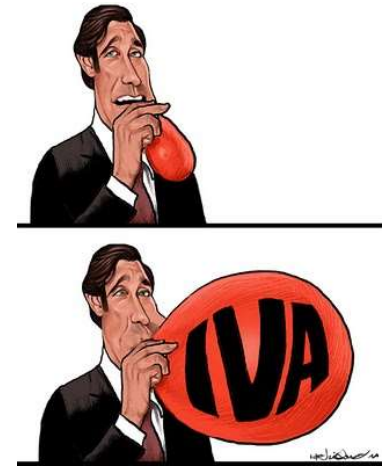
- Law:

- Portaria n.º 363/2010, de 23 de Junho
- Portaria n.º 22-A/2012, de 24 de janeiro
- Portaria n.º 340/2013, de 22 de novembro
- Especificação dos requisitos técnicos – Despacho n.º 8632/2014 de 03 de julho, do Diretor-Geral da AT
- http://info.portaldasfinancas.gov.pt/pt/apoio_contribuinte/CertificacaoSoftware.htm

- List of certified software

- <https://www.portaldasfinancas.gov.pt/pt/TC/Out/consultaProgCertificadosM24.action?&pagina=22>

Invoice



- *Invoice*
- Legal definition(**código art. 36º CIVA**)
 - http://info.portaldasfinancas.gov.pt/pt/informacao_fiscal/codigos_tributarios/civa_rep/iva36.htm
- Issuing of copy of invoice till 5 days after transaction
- Data and numbers sequential order
- Name of company, Address and Tax Number
- Quantities and Item names
- Price without taxes and tax rate applied
- Date where itens were supplied to client

e-fatura



- <https://faturas.portaldasfinancas.gov.pt/>



Electronic Invoice



Electronic Invoice = *Fatura Electronica*

E-Fatura != *Fatura Electronica*

Integrating eGov and eBanking

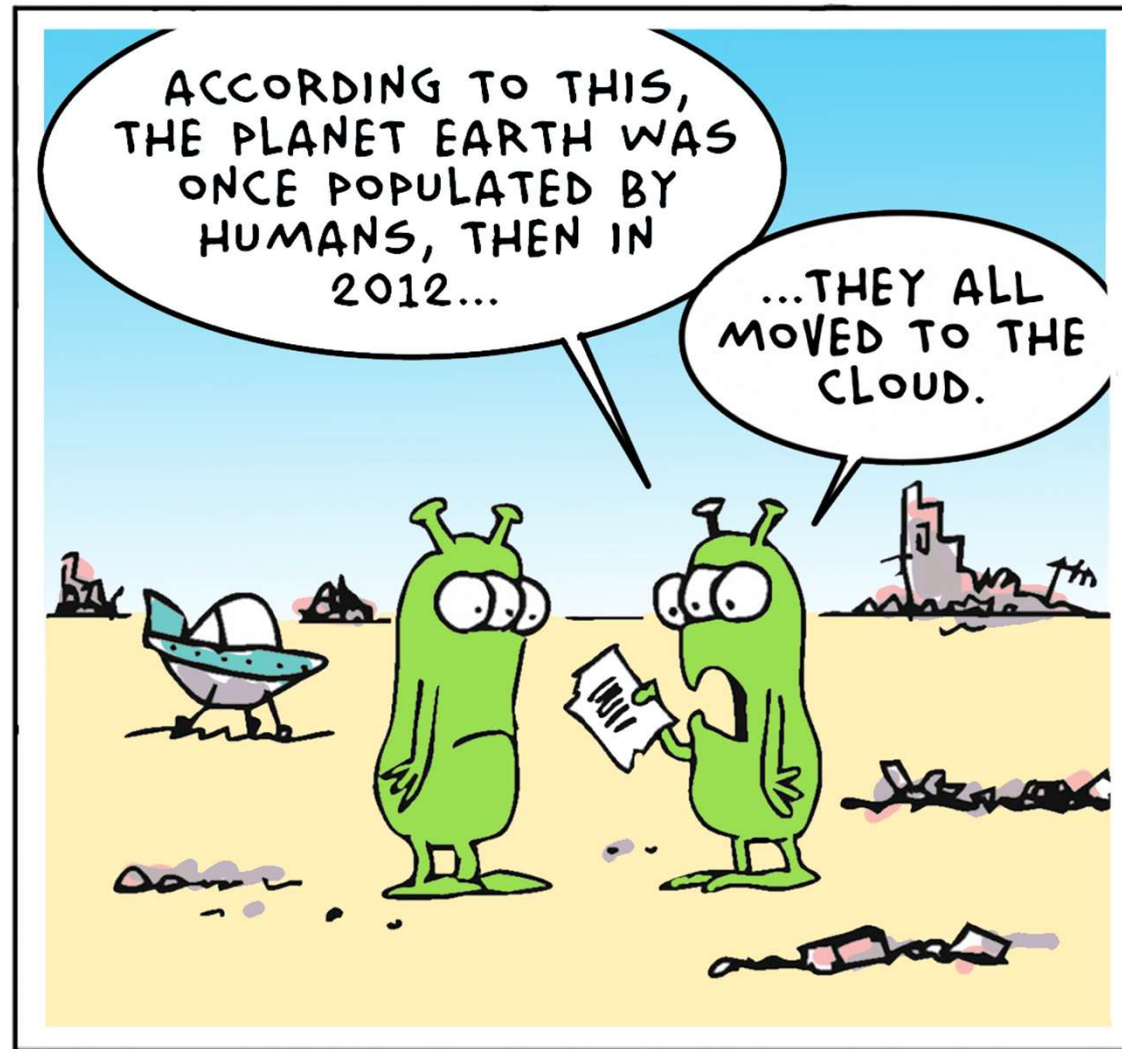


The joy of e-Government:



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<http://www.norwich.net/~randyg/toon.html>





Sites

- Associação de Empresas de Software de Open Source de Portugal (<http://www.esop.pt/>)
- Associação Portuguesa de Software (<http://www.assoft.org/>)
- Dynamics (<http://www.microsoft.com/en-us/dynamics/>)
- Odoo (<https://www.odoo.com/>)
- Oracle
(<https://www.oracle.com/applications/enterprise-resource-planning/>)
- PHC (<http://www.phc.pt/>)
- PrimaveraBSS (<http://www.primaverabss.com>)
- Sage (<http://www.sage.com/>)
- SAP (<http://www.sap.com>)
- Tryton (<http://www.tryton.org/>)

Some References

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- Carlos J. Costa. 2010. Testing usability of ERP open source systems. In *Proceedings of the Workshop on Open Source and Design of Communication (OSDOC '10)*. ACM, New York, NY, USA, 25-30. DOI=10.1145/1936755.1936763 <http://doi.acm.org/10.1145/1936755.1936763>
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- Ana Isabel Mendes Duarte and Carlos J. Costa. 2012. Information systems: life cycle and success. In *Proceedings of the Workshop on Information Systems and Design of Communication (ISDOC '12)*. ACM, New York, NY, USA, 25-30. DOI=10.1145/2311917.2311923 <http://doi.acm.org/10.1145/2311917.2311923>
- Carlos J. Costa and Manuela Aparicio. 2011. ERP and assistance systems. In *Proceedings of the 11th WSEAS international conference on Applied informatics and communications and Proceedings of the international conference on Computational engineering in systems applications (AIASABEBI'11)*, Myriam Lazard, Andris Buikis, S. Yuriy Shmaliy, Roberto Revetria, and Nikos Mastorakis (Eds.). World Scientific and Engineering Academy and Society (WSEAS), Stevens Point, Wisconsin, USA, 216-221.
- Carlos J. Costa. 2010. Supporting ERP open source customization with UML. In *Proceedings of the Workshop on Open Source and Design of Communication (OSDOC '10)*. ACM, New York, NY, USA, 31-34. DOI=10.1145/1936755.1936764 <http://doi.acm.org/10.1145/1936755.1936764>
- Nuno G. Lopes and Carlos J. Costa. 2008. ERP localization: exploratory study in translation: European and Brazilian Portuguese. In *Proceedings of the 26th annual ACM international conference on Design of communication (SIGDOC '08)*. ACM, New York, NY, USA, 93-98. DOI=10.1145/1456536.1456555 <http://doi.acm.org/10.1145/1456536.1456555>