



Lisbon School  
of Economics  
& Management  
Universidade de Lisboa



Carlos J. costa

# ERP

# ENTERPRISE RESOURCE PLANNING

(2025 version)

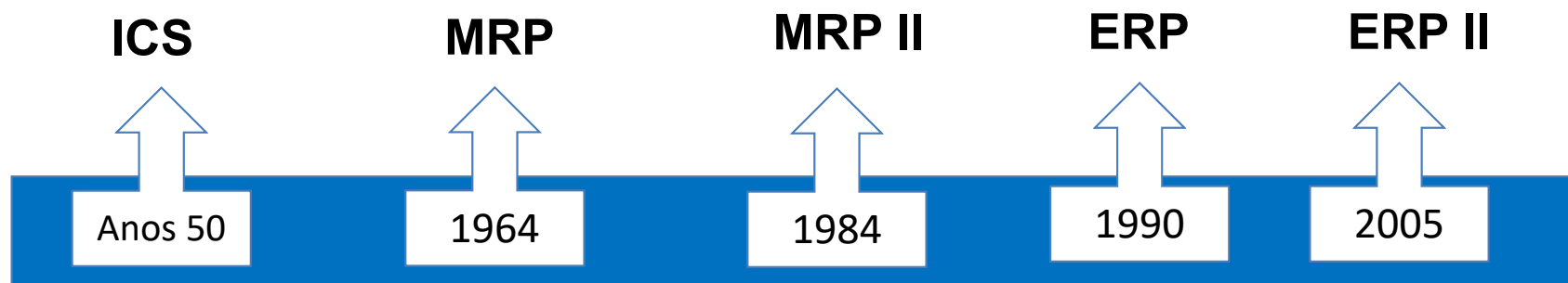


# Agenda

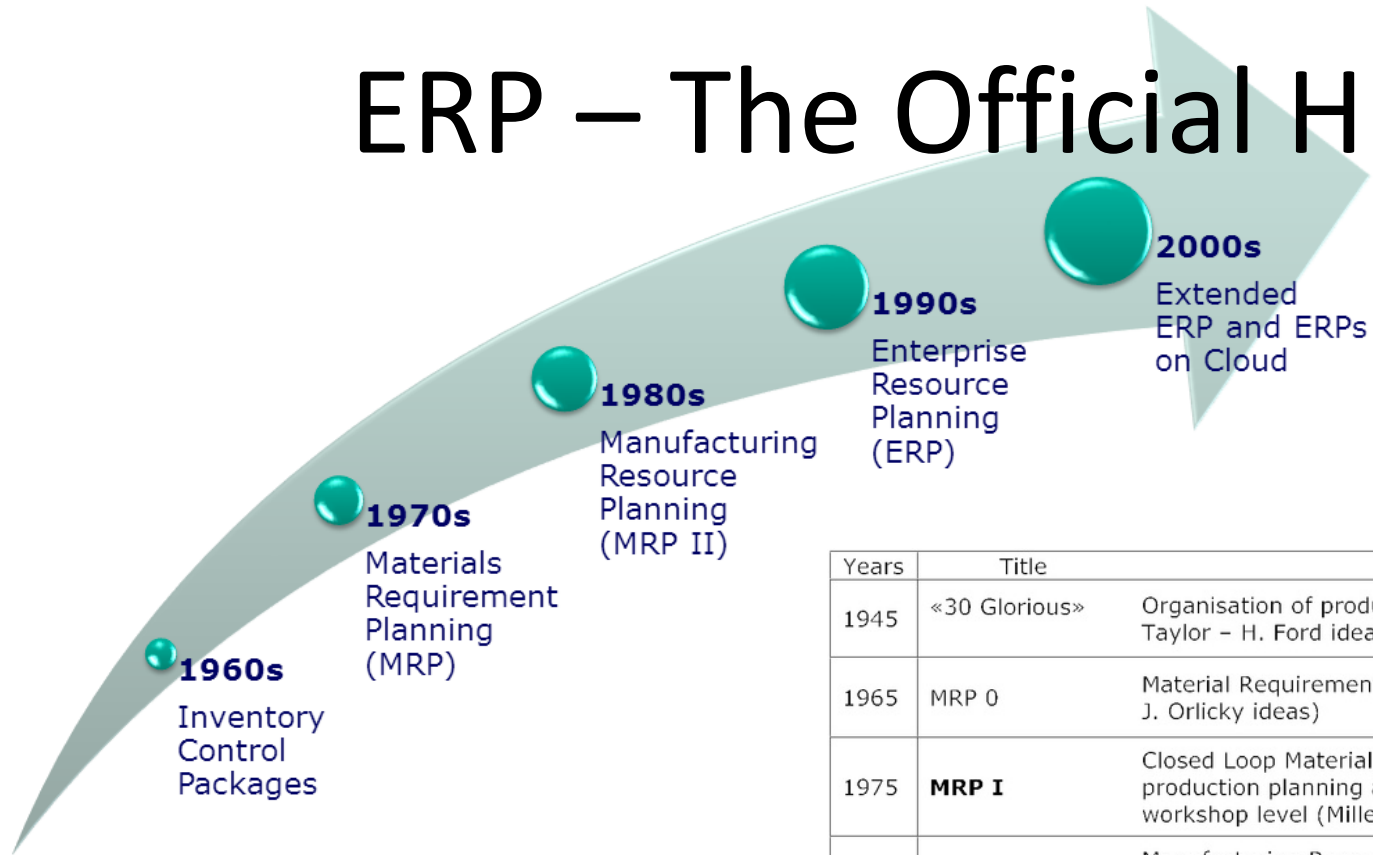
- ERP- The official history
- ERP concept
- ERP- Integrated System
- Advantages to management
- ERP Architecture
- Market
- Open Source
- Law and Tax Issues

# 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  | <b>MRP I</b>  | Closed Loop Material Requirement Planning, setting of production planning and its execution control on workshop level (Miller-Spreague)                              |
| 1980  | <b>MRP II</b> | 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  | <b>ERP</b>    | 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 |

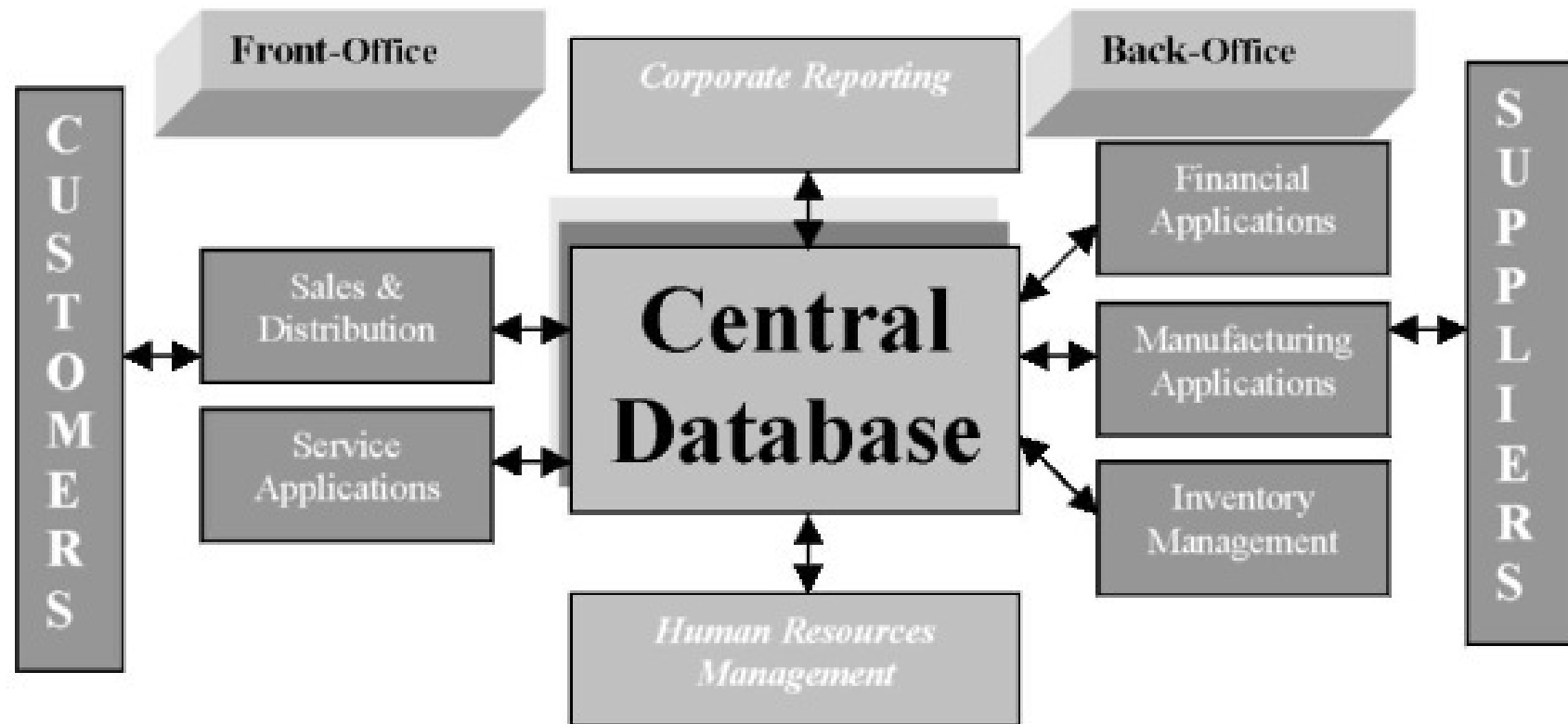
# Concept

- *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

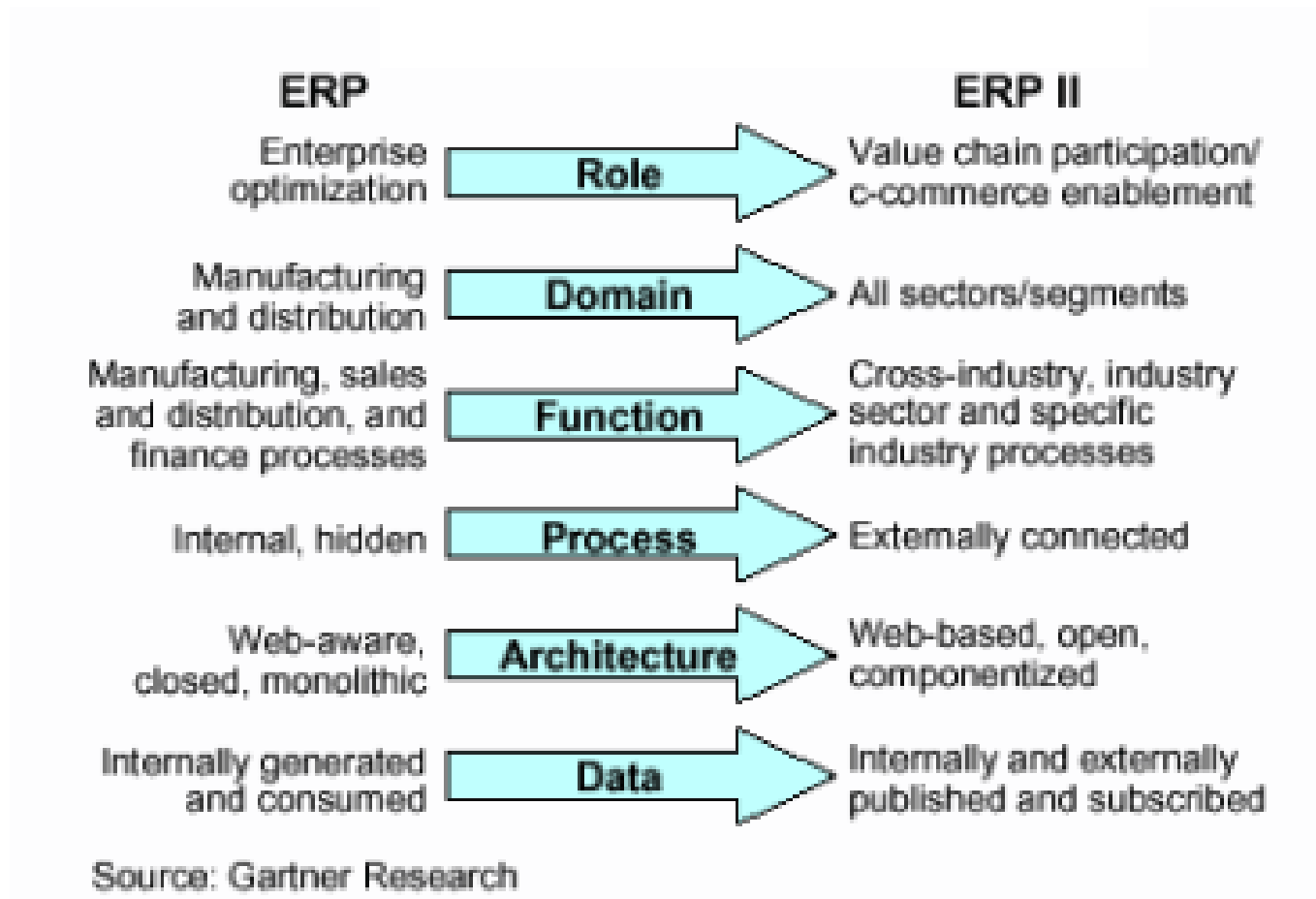
- ERP II is a transformation of ERP into a new generation of enterprise systems.

(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.

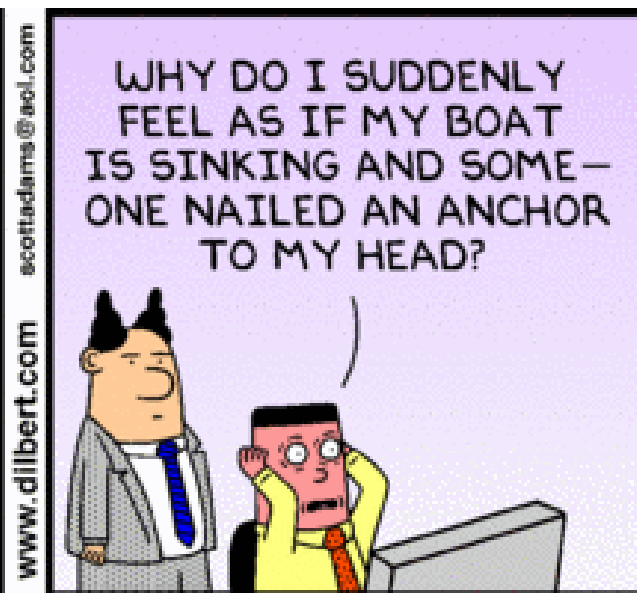
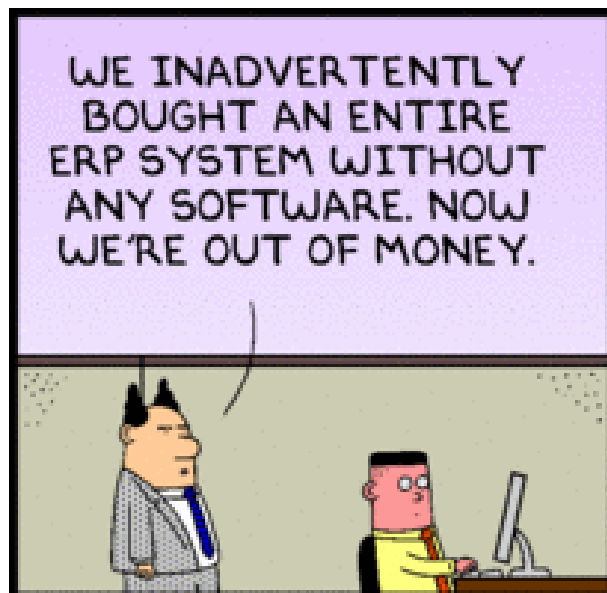
(Grabot, Mayere, Lauroua, & Houe, 2014)

# ERP II



# Advantages of ERP

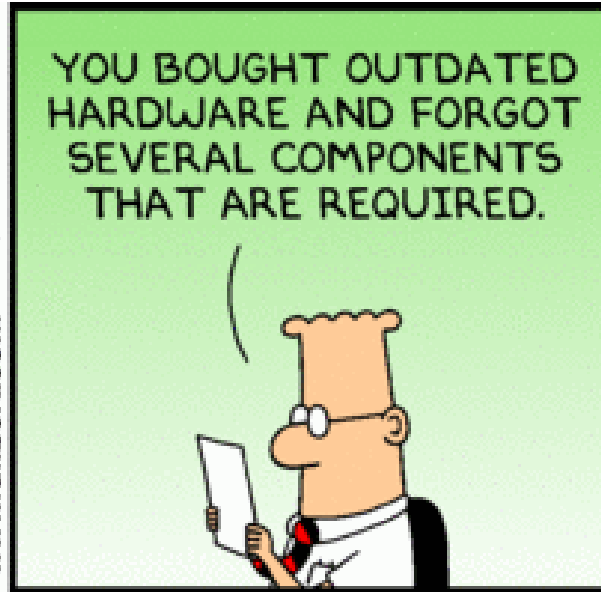
- Support business growth
- Change Legacy systems
- Improve business processes
- Reduce maintainance
- Reduce administrative Costs
- Prevent input of redundact data
- Decrease stoks maintance costs
- Decrease data entrance errors
- Multi currency systems are possible
- Decrease system operation costs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



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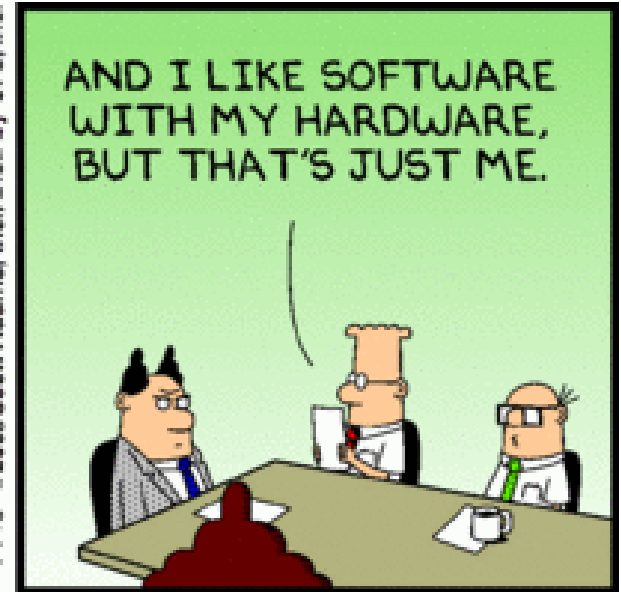


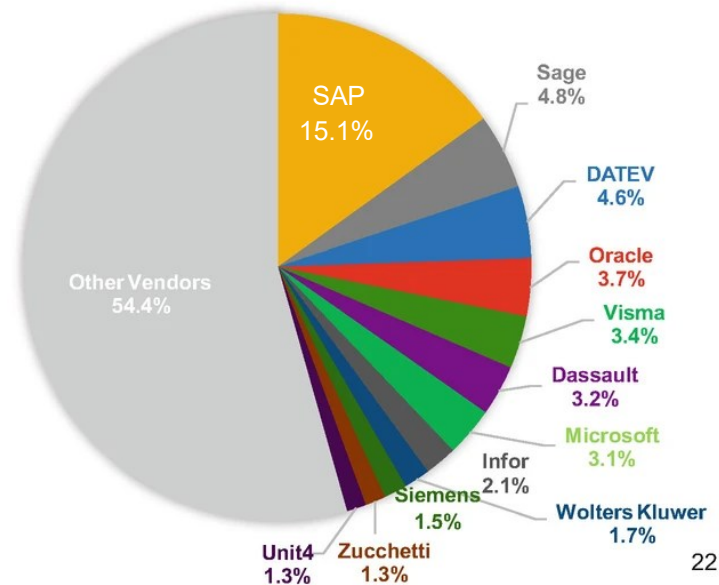
Figure 1: Magic Quadrant for Cloud ERP for Product-Centric Enterprises



Source: Gartner (August 2022)

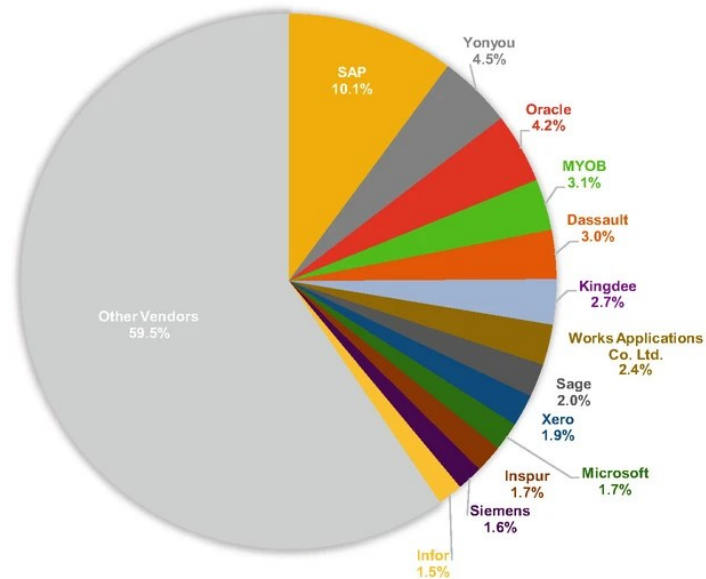
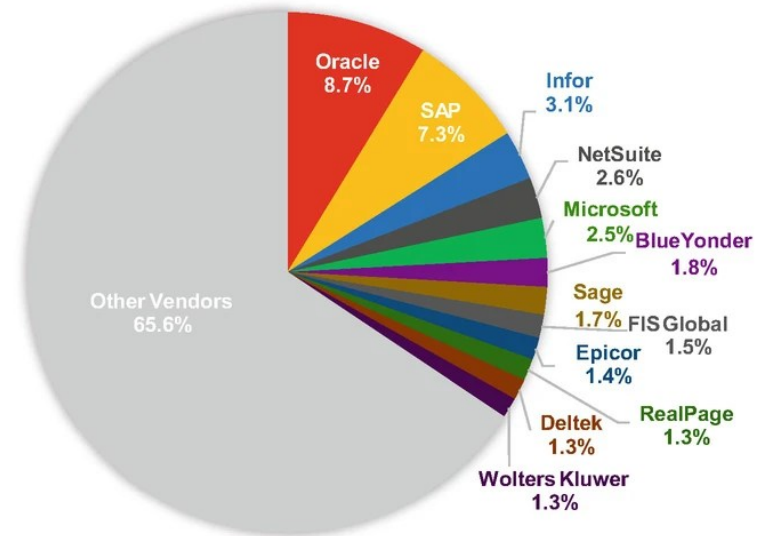
## EUROPE MIDDLE EAST AFRICA

MARKET SIZE: €18B



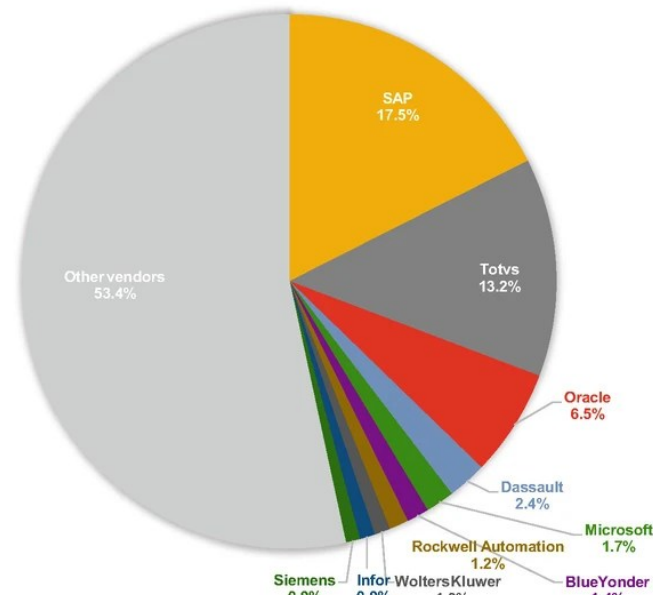
## NORTH AMERICA

MARKET SIZE: €23.5B



MARKET SIZE: €9.4B

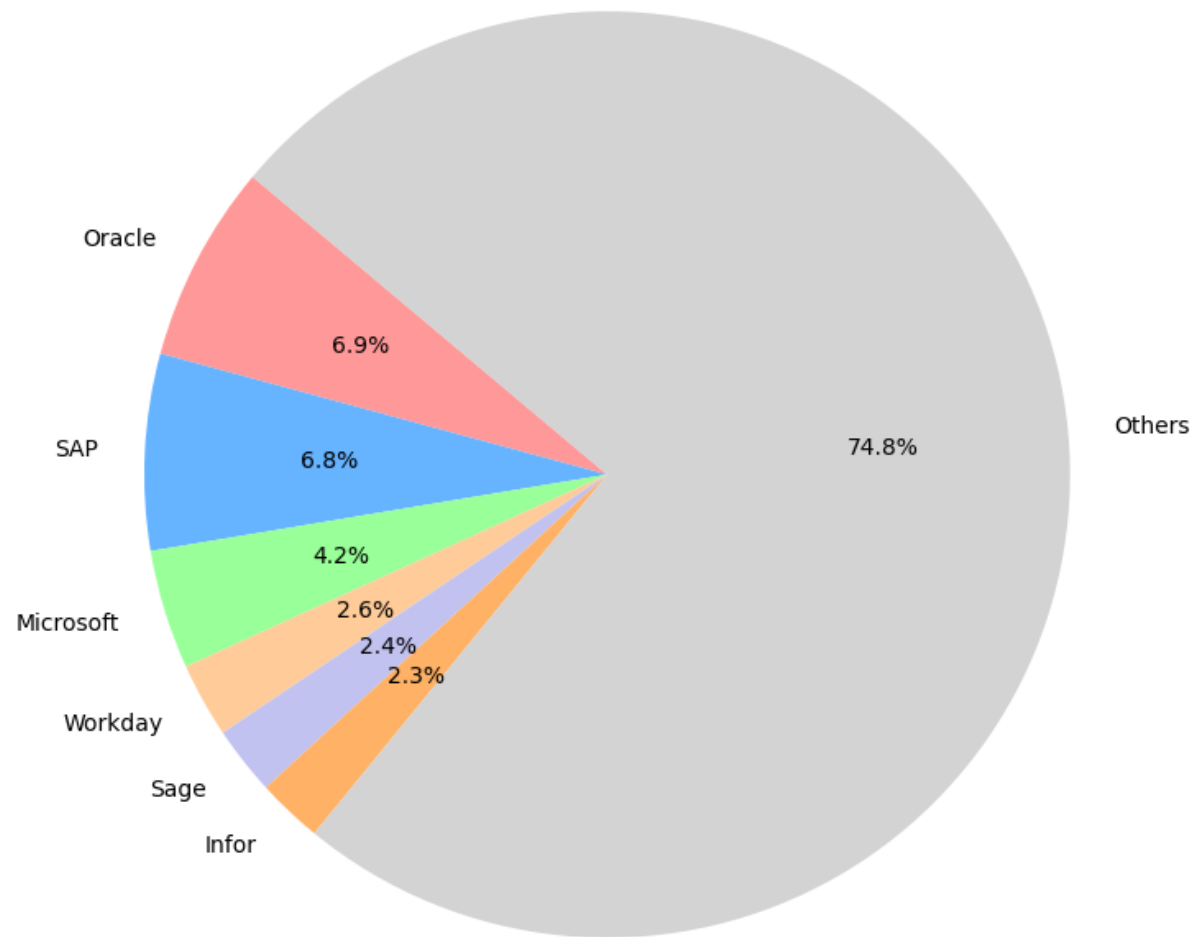
## ASIA PACIFIC JAPAN CHINA



MARKET SIZE: €2.0B

## LATIN AMERICA

Global ERP Software Market Share (2024)



Rasmus Leichter (2025). "How Big is the ERP Market? (2025)". Retrieved from <https://www.cargoson.com/en/blog/how-big-is-the-erp-market>



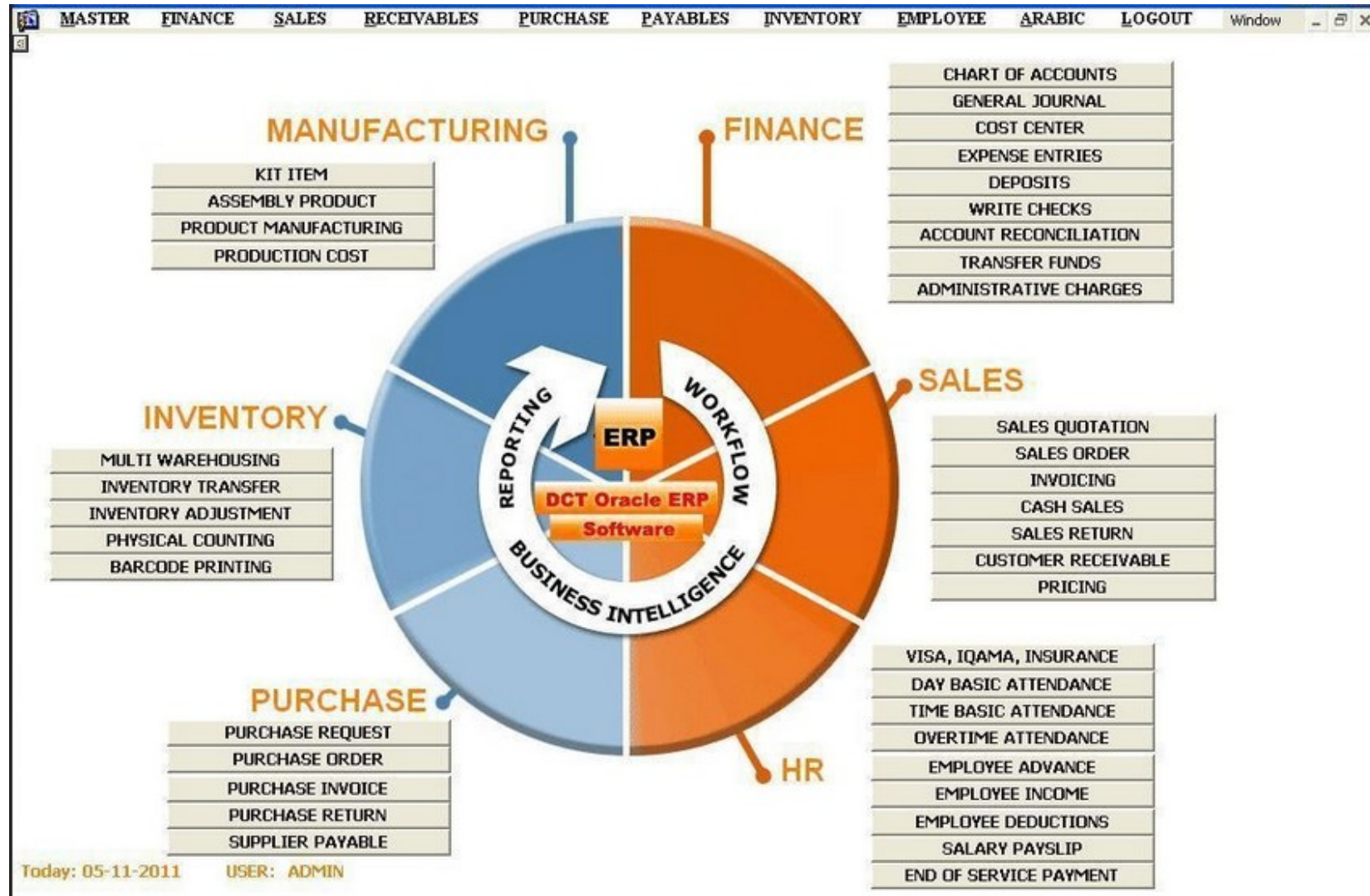
# Firms



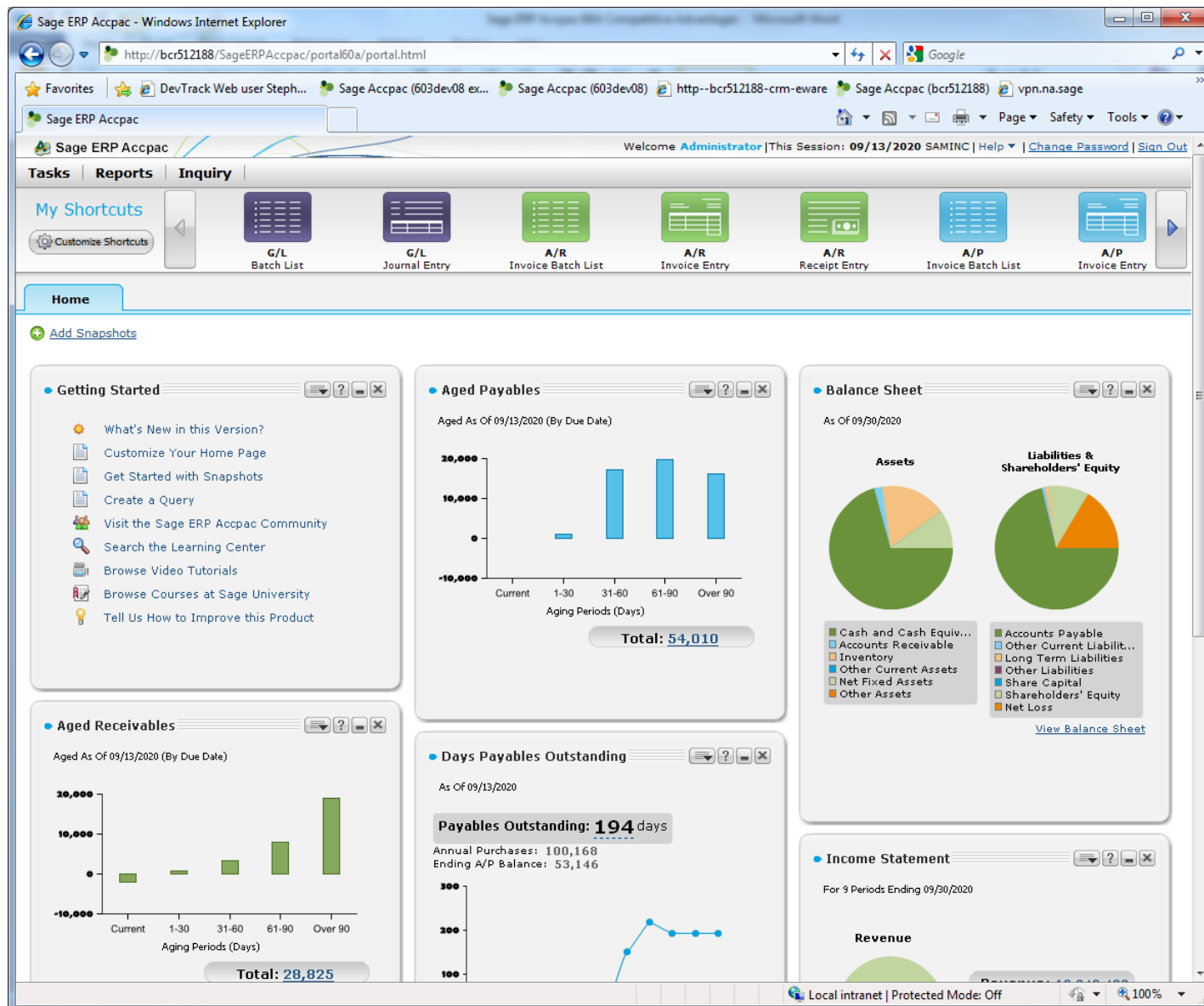
# SAP

|                                   | 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

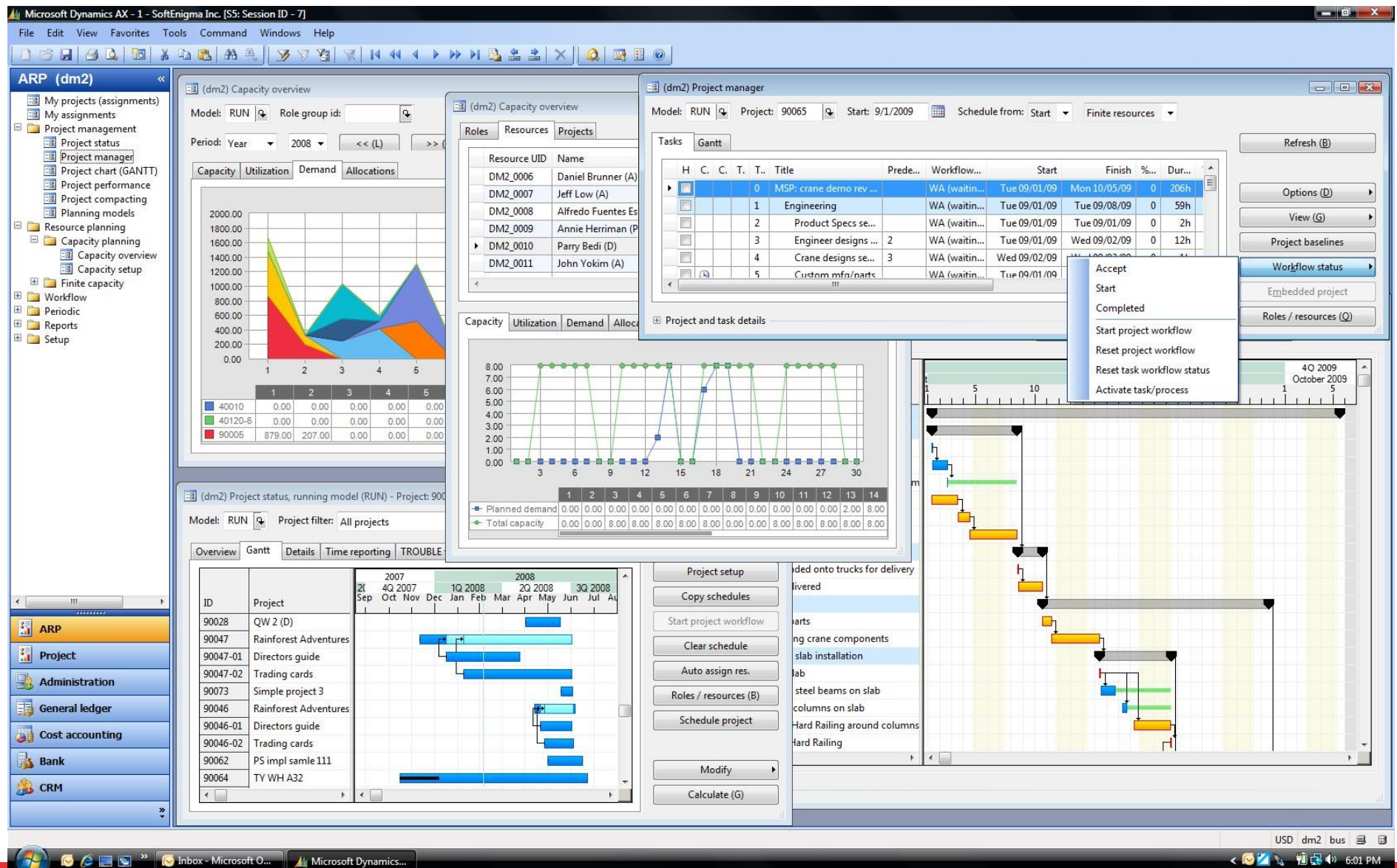


# SAGE





# Microsoft Dymamics



# Portuguese Market

**cegid**  
Primavera

**cegid** Eticadata

**cegid** PHC



# Open Source

odoo

Dolibarr<sup>ERP/CRM</sup>

openbravo<sup>®</sup>

Tryton

ERP5

COMPIERE

ofbiz<sup>™</sup> The Apache Open for Business Project



webERP

+ erpnext



FrontAccounting<sup>ERP</sup>

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'.

**Main Menu**

- Sales
- Receivables
- Payables
- Purchases
- Inventory
- Manufacturing
- General Ledger
- Asset Manager
- Petty Cash
- Setup
- Utilities

**Transactions**

- 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**

- 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

**Standard Reports and Forms**

There are no reports to show!

**Custom Reports**

There are no reports to show!

**Maintenance**

- Select Contract
- Create Contract

**Footer**

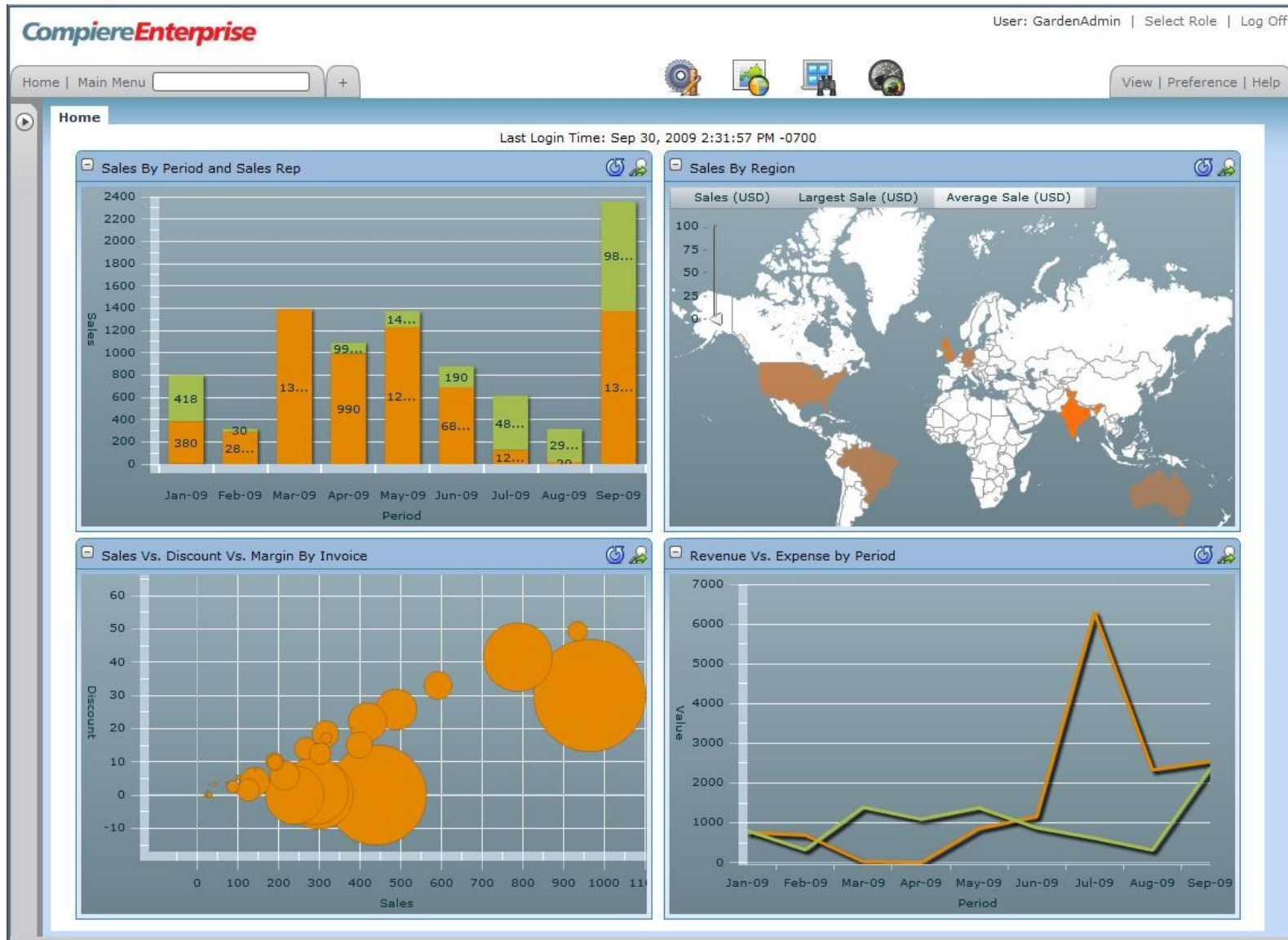
webERP version 4.09 Copyright © 2004 - 2012 [weberp.org](http://weberp.org) Saturday 6 October 19:11



# OpenBravo

The screenshot displays the OpenBravo web application interface for the 'Sales Dimensional Report'. The top navigation bar includes the 'yourCOMPANY' logo, a breadcrumb trail ('Sales Management || Analysis Tools || Sales Dimensional Report || Sales Dimensional Report'), and the 'powered by openbravo' logo. A left-hand sidebar menu lists various system modules such as 'General Setup', 'Master Data Management', 'Procurement Management', 'Warehouse Management', 'Production Management', 'Material Requirement Planning (MRP)', 'Sales Management', 'Transactions', 'Analysis Tools', 'Project & Service Management', 'Financial Management', 'Openbravo ERP', and 'Information'. The 'Sales Dimensional Report' is currently selected under 'Analysis Tools'. The main content area is titled 'Sales Dimensional Report' and contains several filter sections: 'Primary Filters' with 'From Date' and 'To Date' (both set to 31) and a 'Comparative Report' checkbox; 'Secondary Filters' with dropdowns for 'Organization', 'Warehouse', 'Business Partner Group', 'Product Group', 'Business Partner', '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 list box; '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

[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

ADempiere

SuperUser@System.\*

Preference System Administrator Log Out

Menu (10) Window, Tab Field Table and Column

Table

Table Translation

Column Translation

Table Script Validator

Client System Organization \*

DB Table Name\* AD\_AccessLog

Name\* Access Log

Description Log of Access to the System

Comment/Help

☒ Active ☐ View

Data Access Level\* System+Client ☐ Maintain Change Log

Window Access Audit PO Window

☒ Records deleteable ☐ High Volume

Entity Type Dictionary

Create Columns from DB

Copy Columns from Table

Column

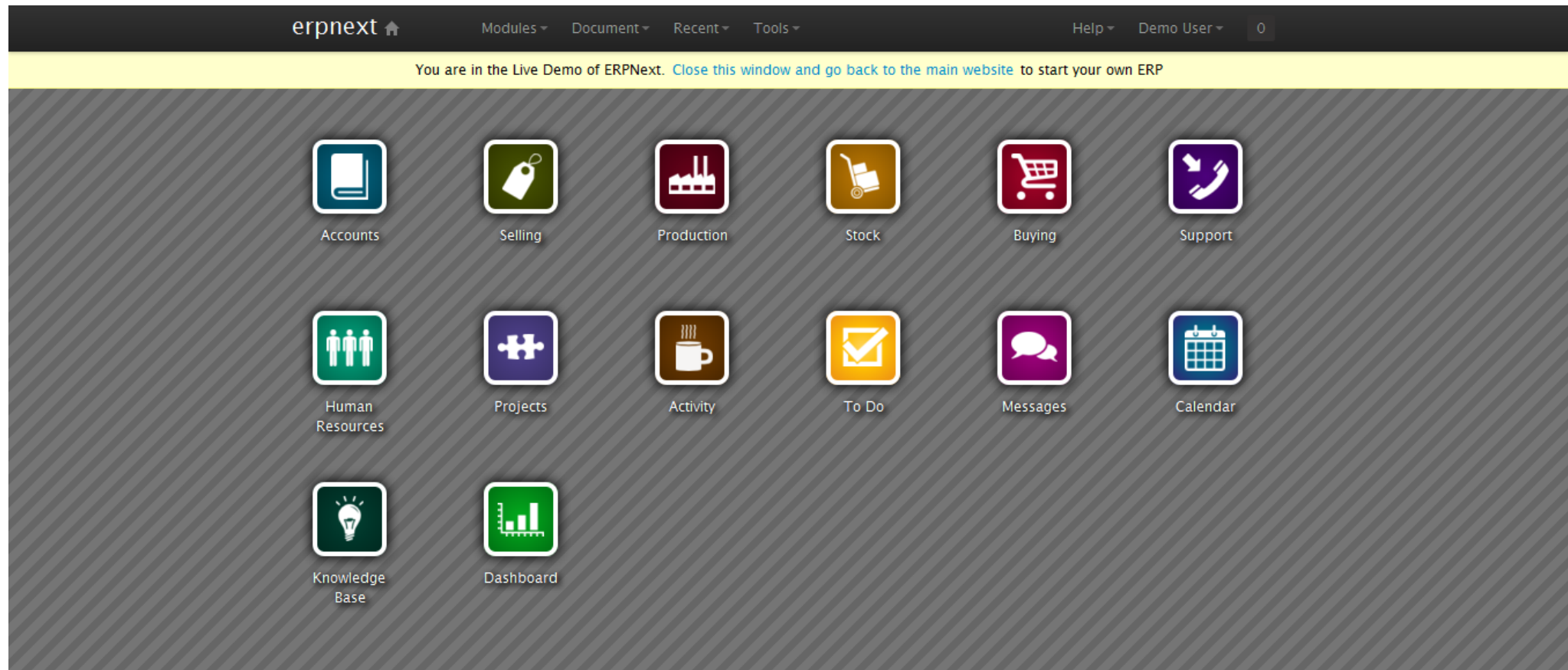
| Client | Organization | Table              | DB Column Name | Column SQL |
|--------|--------------|--------------------|----------------|------------|
| System | *            | AD_AccessLog_Ac... | AD_Column_ID   |            |
| System | *            | AD_AccessLog_Ac... | AD_Client_ID   |            |
| 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        |            |

Navigate or Update record

Adempiere - Google Chrome 1/801

Entrada - Thu... C:\temp Delphi 7 Adempiere - ... Sem titulo - Paint PT 08:32

# ERPNext



# Invoice software certification (Portugal)



- Law:

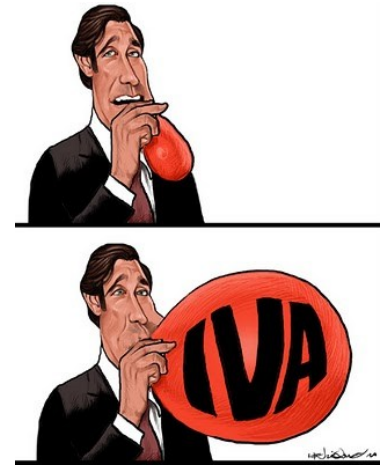
- Portaria n.º 363/2010, de 23 de Junho
- Portaria n.º 22-A/2012, de 24 de janeiro
- Portaria n.º 340/2013, de 22 de novembro
- Especificação dos requisitos técnicos – Despacho n.º 8632/2014 de 03 de julho, do Diretor-Geral da AT
- [http://info.portaldasfinancas.gov.pt/pt/apoio\\_contribuinte/CertificacaoSoftware.htm](http://info.portaldasfinancas.gov.pt/pt/apoi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

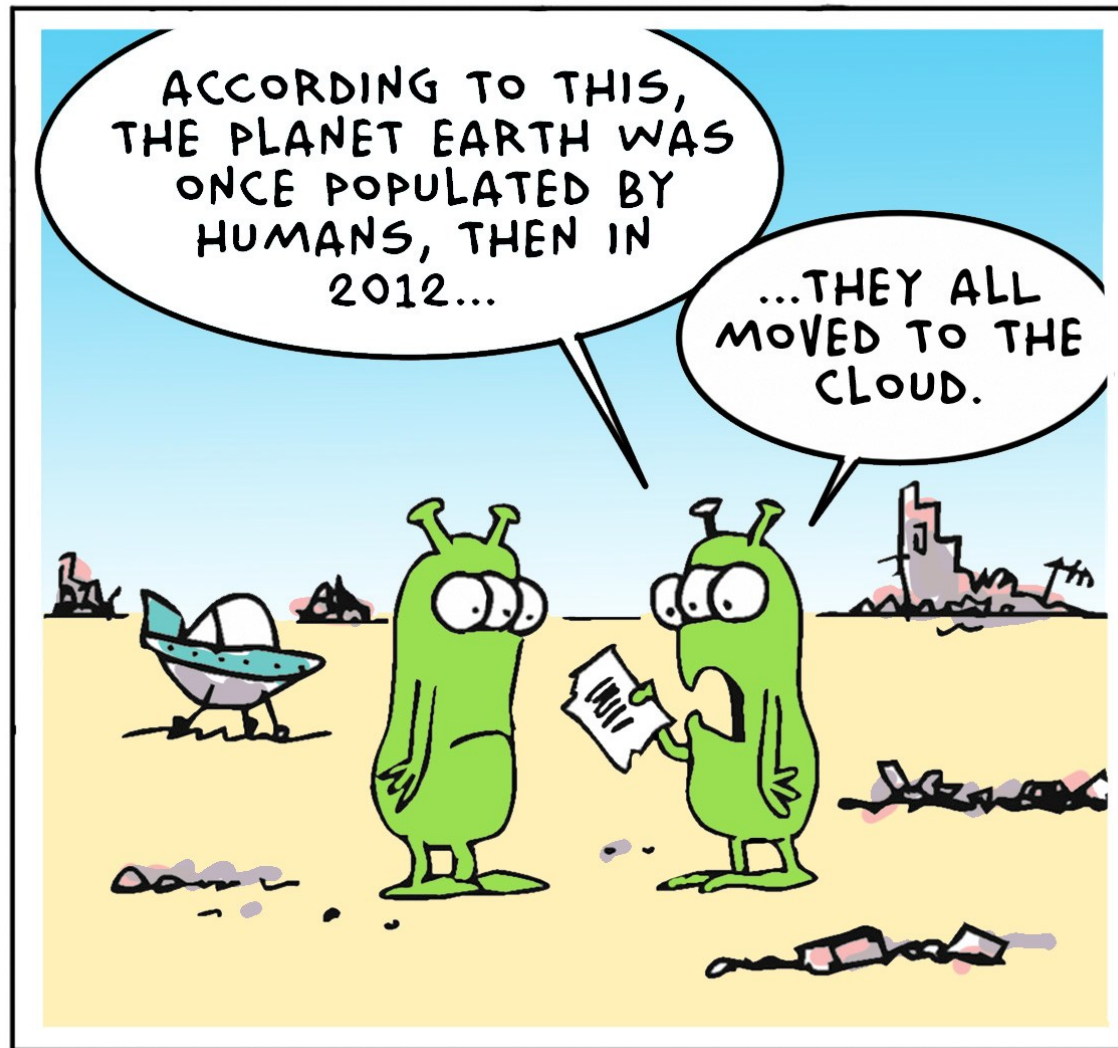


## The joy of e-Government:



© 1997 by Randy Glasbergen. E-mail: [randyg@norwich.net](mailto:randyg@norwich.net)  
<http://www.norwich.net/~randygtoon.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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- Mario Batista, Carlos J. Costa, and Manuela Aparicio. 2013. ERP OS localization framework. In Proceedings of the Workshop on Open Source and Design of Communication (OSDOC '13). ACM, New York, NY, USA, 1-8. DOI=10.1145/2503848.2503849 <http://doi.acm.org/10.1145/2503848.2503849>
- 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>
- Rasmus Leichter. 2025. "How Big is the ERP Market? (2025)". Retrieved from <https://www.cargoson.com/en/blog/how-big-is-the-erp-market>
- Siar Sarferaz, 2022. ERP Market Analysis. In: Compendium on Enterprise Resource Planning. Springer, Cham. [https://doi.org/10.1007/978-3-030-93856-7\\_2](https://doi.org/10.1007/978-3-030-93856-7_2)