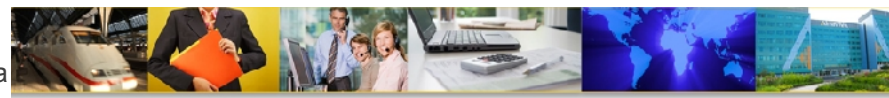


# Sistemi ERP

*Un approccio web ed open source*



Tommaso Anzidei  
[t.anzidei@tsf.it](mailto:t.anzidei@tsf.it)

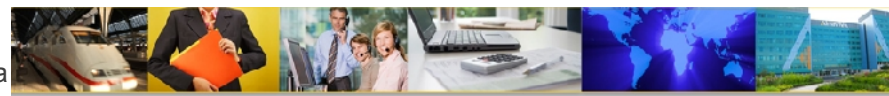


# E<sub>nterprise</sub> R<sub>esource</sub> P<sub>lanning</sub>

## Agenda

- I sistemi ERP: obiettivi, storia ed architettura
- Sistemi ERP open source
- Open ERP: ERP per le masse
- Personalizzazione di Open ERP con Python
- Un esempio concreto: la city logistics

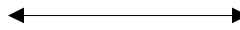




# **E**nterprise **R**esource **P**lanning



**E**nterprise



**A**zienda

**R**esource



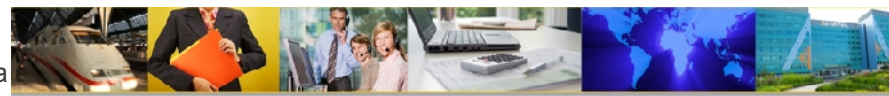
**P**ersone, Prodotti, Mezzi, ...

**P**lanning



**T**empi, Quantità, Luoghi, ...

Sistema di gestione che integra tutti i processi di business rilevanti di un'azienda  
(vendite, acquisti, gestione magazzino, contabilità etc.)

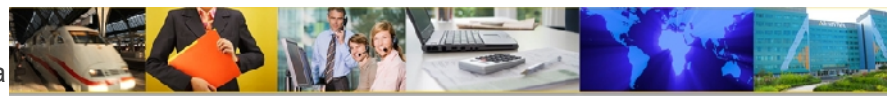


## Che cos'è un ERP

Si tratta di un sistema di gestione, chiamato in informatica sistema informativo, che integra tutti i processi di business rilevanti di un'azienda (vendite, acquisti, gestione magazzino, contabilità etc.).

Con l'aumento della popolarità dell'ERP e la riduzione dei costi per l'ICT (Information and Communication Technology), si sono sviluppate applicazioni che aiutano i business manager ad implementare questa metodologia nelle attività di business come: controllo di inventari, tracciamento degli ordini, servizi per i clienti, finanza e risorse umane.





## componenti di un ERP (1)

**Contabilità:** *sistema di rilevazione continua di qualunque evento di rilevanza economica*

**Controllo di gestione:** *processo volto a guidare la gestione verso il conseguimento degli obiettivi stabiliti in sede di pianificazione operativa*

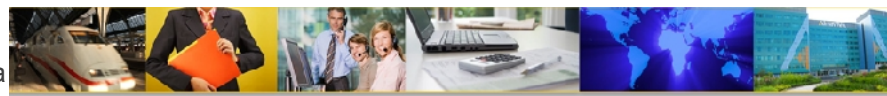
**Gestione del personale:** *funzione aziendale che riguarda la gestione del personale nel suo più vasto significato*

**Gestione acquisti:** *razionalizzazione dei fornitori e dei relativi costi*

**Gestione dei magazzini:** *controllo delle merci in entrata e in uscita*

**Gestione della produzione:** *insieme di attività integrate che consentono di ottenere, secondo cicli di lavorazione prestabiliti, partendo da opportune materie prime, prodotti finiti richiesti dai clienti in quantità, caratteristiche e tempi prefissati e a costi e livelli qualitativi ben specificati*





## componenti di un ERP (2)

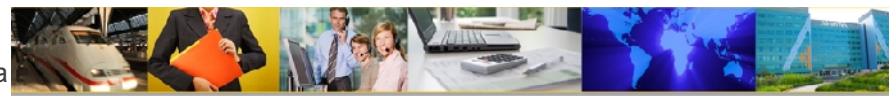
**Gestione progetti:** *attività volte alla realizzazione degli scopi/obiettivi di un progetto*

**Gestione vendite:** *raggiungimento di obiettivi di vendita di un'azienda in modo efficace ed efficiente attraverso la pianificazione e il controllo delle risorse organizzative*

**Gestione della distribuzione (supply chain management):** *attività logistiche delle aziende, con l'obiettivo di controllare le prestazioni e migliorarne l'efficienza*

**Gestione degli asset:** *attività di monitoraggio e manutenzione di tutte le risorse materiali che costituiscono un valore per l'azienda*



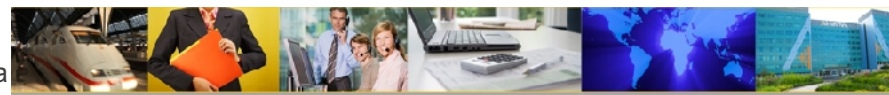


# Un Sistema ERP



## End-User Service Delivery

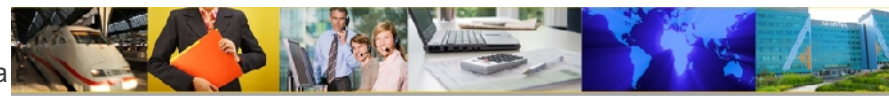
Analytics	Strategic Enterprise Management		Financial Analytics	Operations Analytics	Workforce Analytics
Financials	Financial Supply Chain Management		Financial Accounting	Management Accounting	Corporate Governance
Human Capital Management	Talent Management		Workforce Process Management		Workforce Deployment
Procurement and Logistics Execution	Procurement	Supplier Collaboration	Inventory and Warehouse Management	Inbound and Outbound Logistics	Transportation Management
Product Development and Manufacturing	Production Planning	Manufacturing Execution	Enterprise Asset Management	Product Development	Life-Cycle Data Management
Sales and Service	Sales Order Management	Aftermarket Sales and Service	Professional-Service Delivery	Foreign-Trade Management	Incentive and Commission Management
Corporate Services	Real Estate Management	Project Portfolio Management	Travel Management	Environment, Health and Safety	Quality Management
SAP NetWeaver	People Integration		Information Integration	Process Integration	Application Platform



# S storia dei sistemi ERP







# S

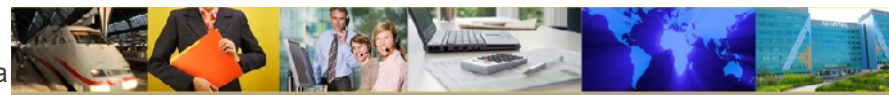
## toria dei sistemi ERP



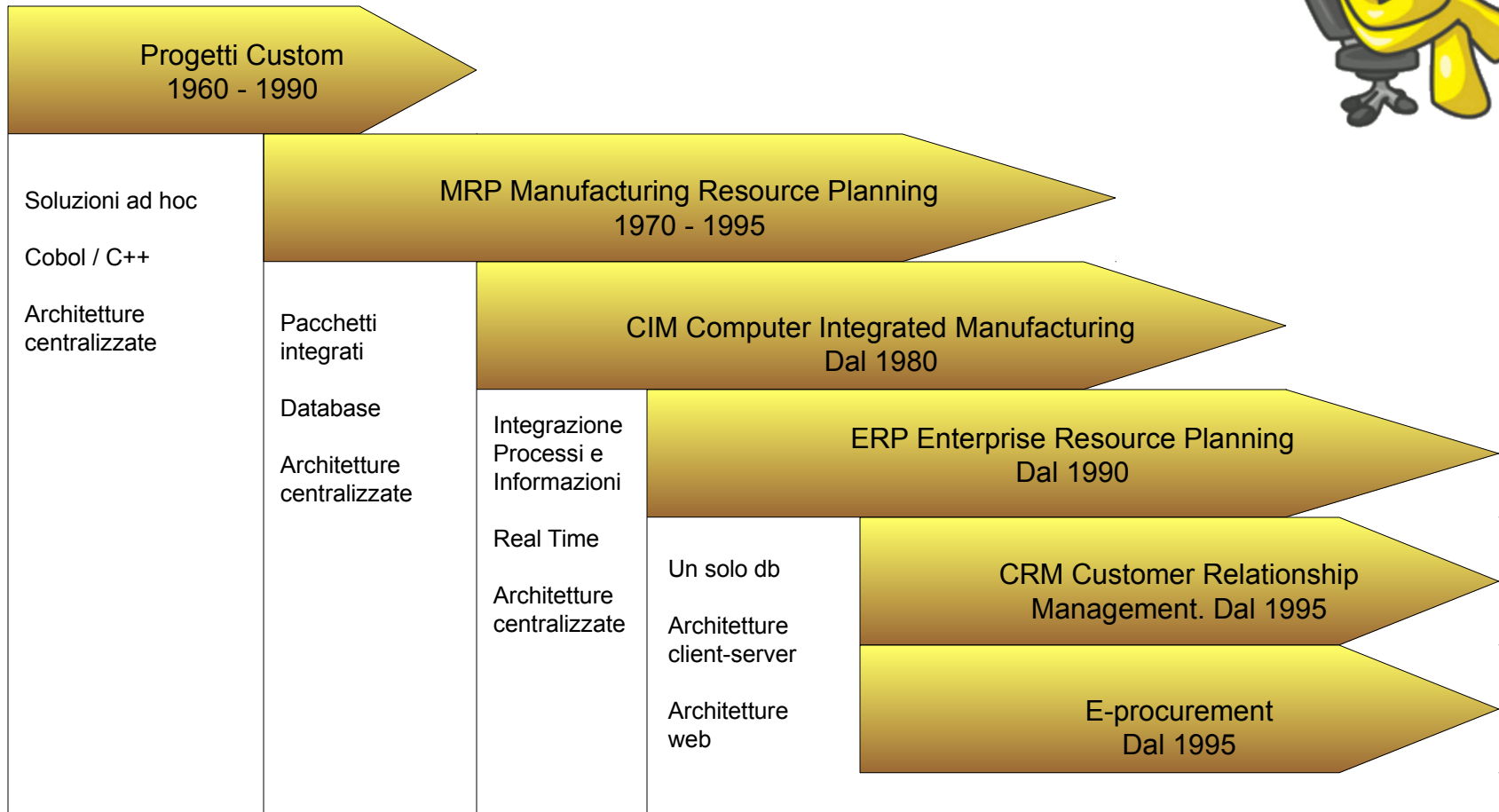
**CIM** – Computer Integrated Manufacturing ('70)  
*Integrano SI gestionali con controllo di processo*

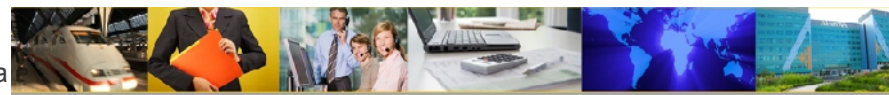
**MRP** – Material Requirement Planning ('80)  
**MRP II** – Manufacturing Resource Planning  
*Sistemi per gestione materiali e produzione*

**ERP** – Enterprise Resource Planning ('90)  
*Funzioni MRP +  
Supporto vendita e distribuzione +  
Portafoglio “istituzionale” (contabilità, finanza, personale...) +  
Funzionalità avanzate*



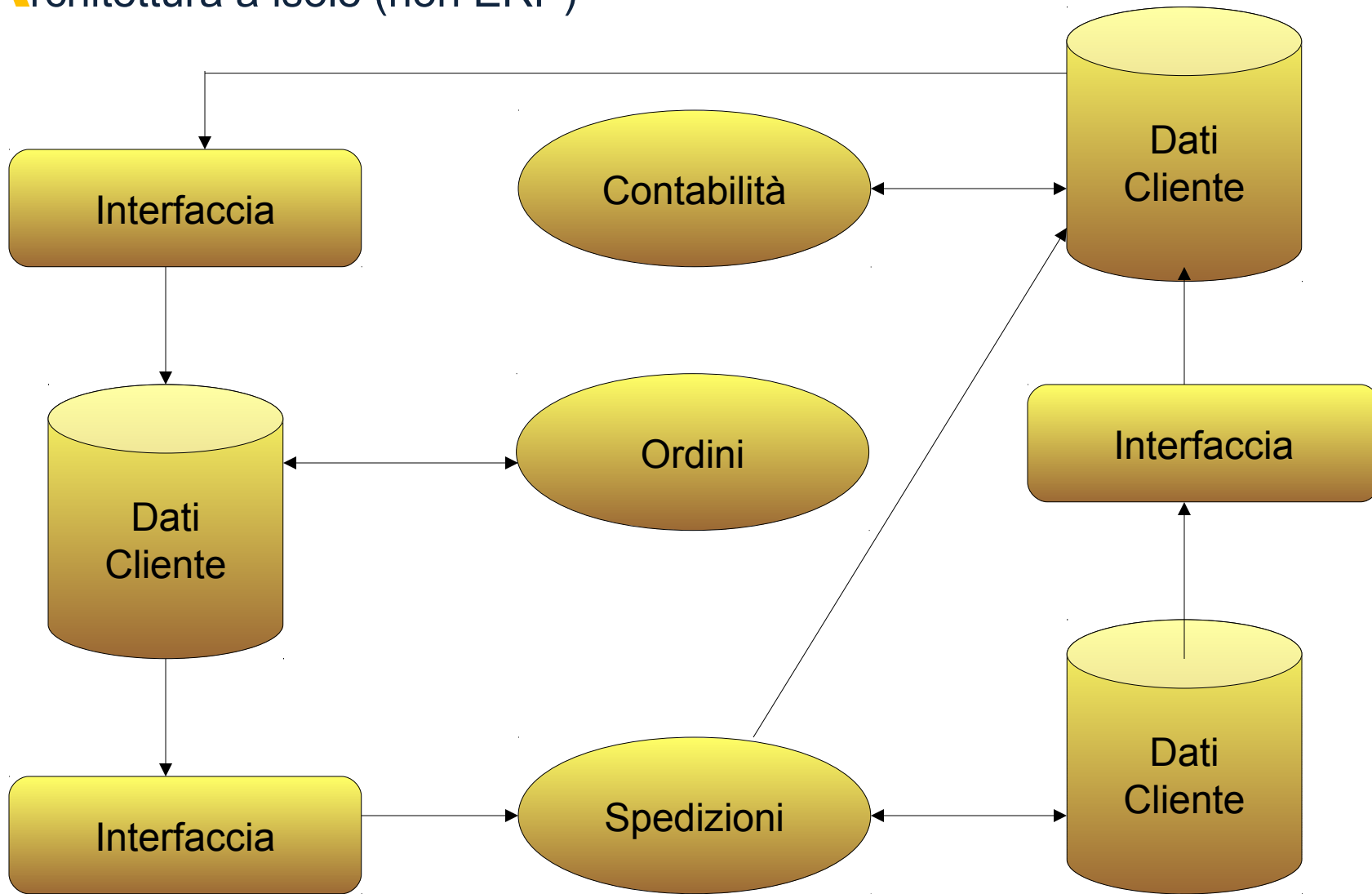
# Evoluzione dei sistemi ERP

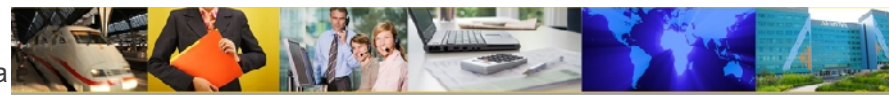




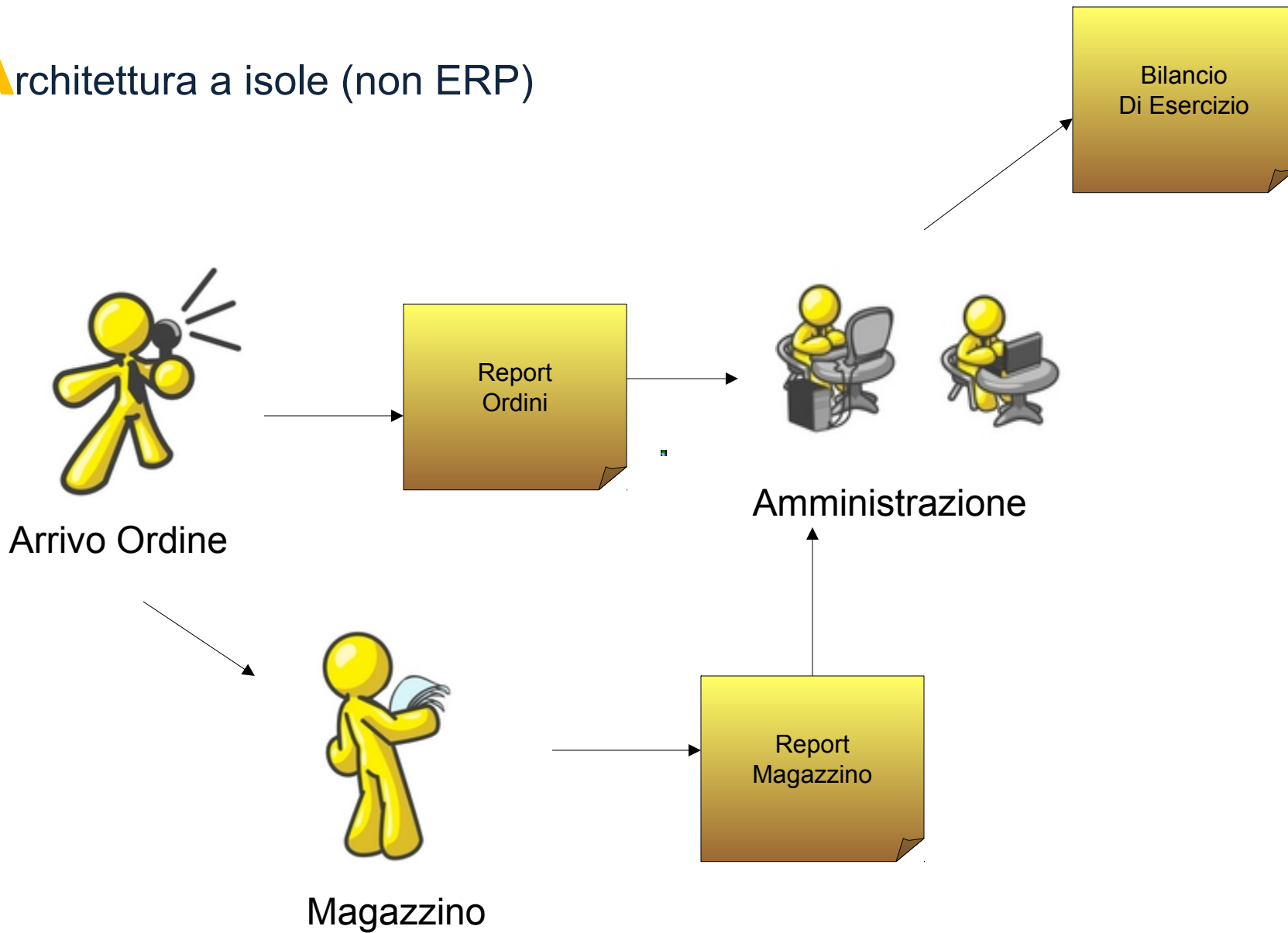
# A

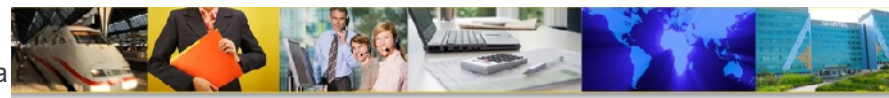
## rchitettura a isole (non ERP)





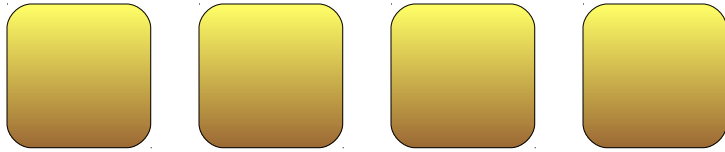
# Architettura a isole (non ERP)



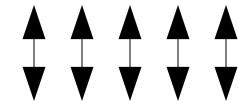
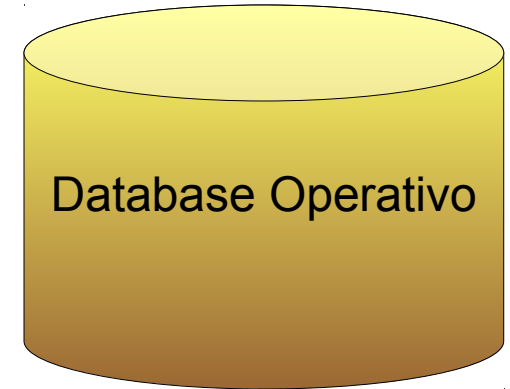
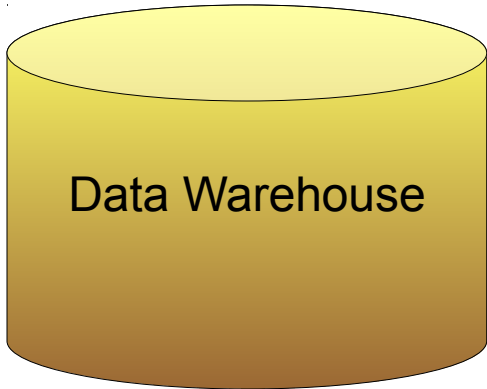
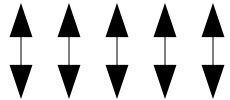


# A

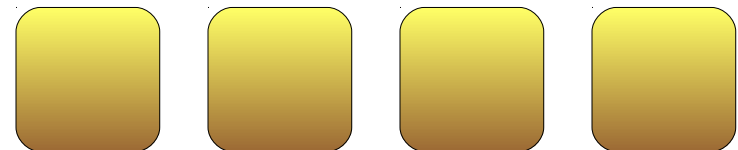
## rchitettura ERP

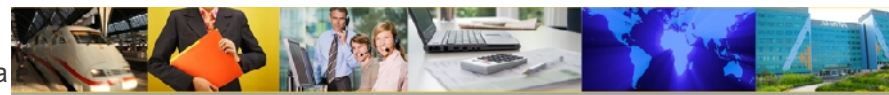


Sistemi a supporto delle decisioni

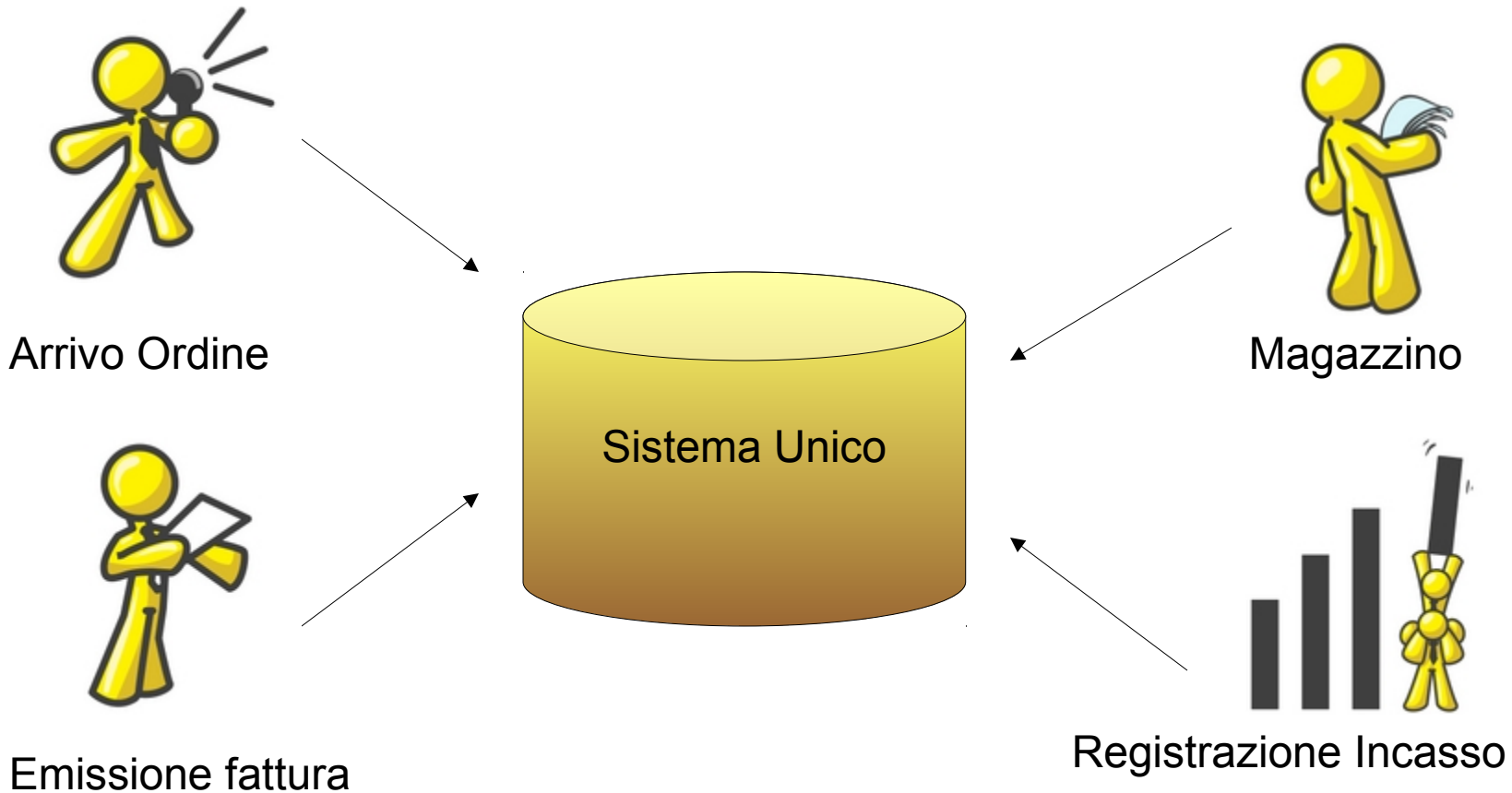


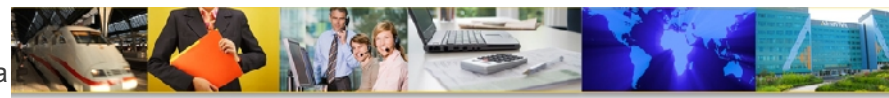
Sistemi a supporto dei processi





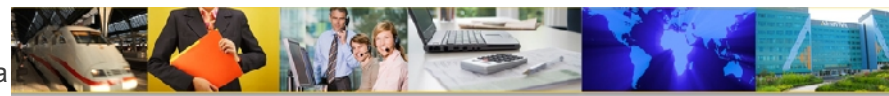
# Architettura ERP





# I maggiori produttori di soluzioni ERP



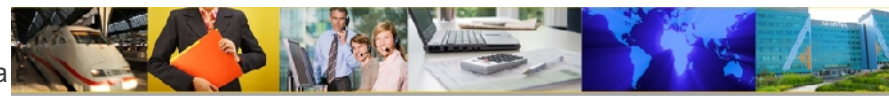


# Costi di un sistema ERP

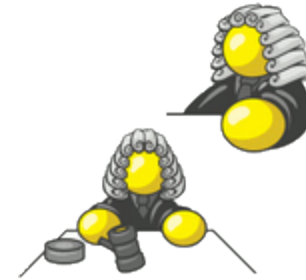


Nel 2008 una licenza di Microsoft Dynamics costava, in dipendenza dai componenti scelti, tra i **20.000** e gli **800.000** € [fonte <http://erp.pmi.it>]



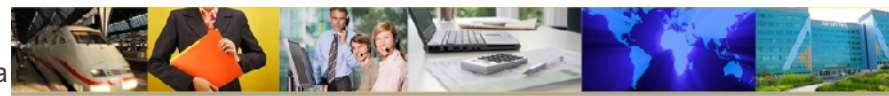


# S software open source

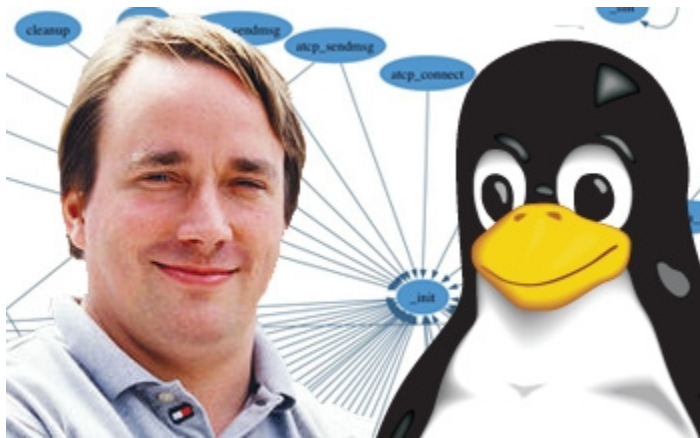
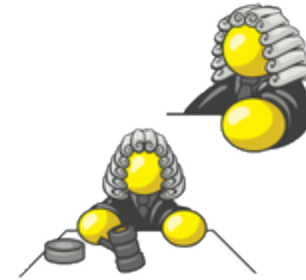


La società ha bisogno di libertà: quando un programma ha un proprietario, l'utilizzatore perde la libertà di controllare parte della sua vita.

*Richard Stallman*

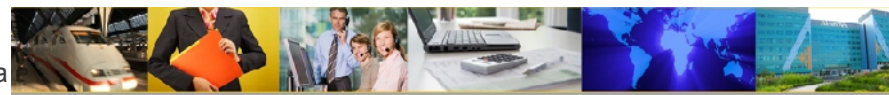


# S software open source

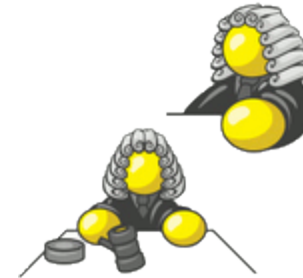


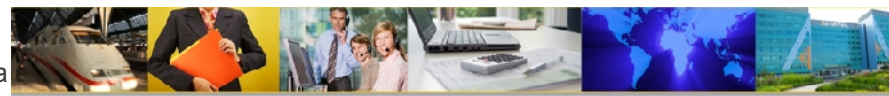
Sono convinto che l'informatica abbia molto in comune con la fisica. Entrambe si occupano di come funziona il mondo a un livello abbastanza fondamentale. La differenza, naturalmente, è che mentre in fisica devi capire come è fatto il mondo, in informatica sei tu a crearlo. Dentro i confini del computer, sei tu il creatore. Controlli – almeno potenzialmente – tutto ciò che vi succede. Se sei abbastanza bravo, puoi essere un dio. Su piccola scala.

*Linus Torvalds*



# Sistemi ERP open source



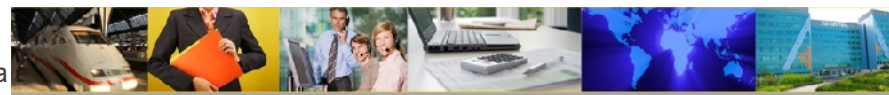


# Open ERP

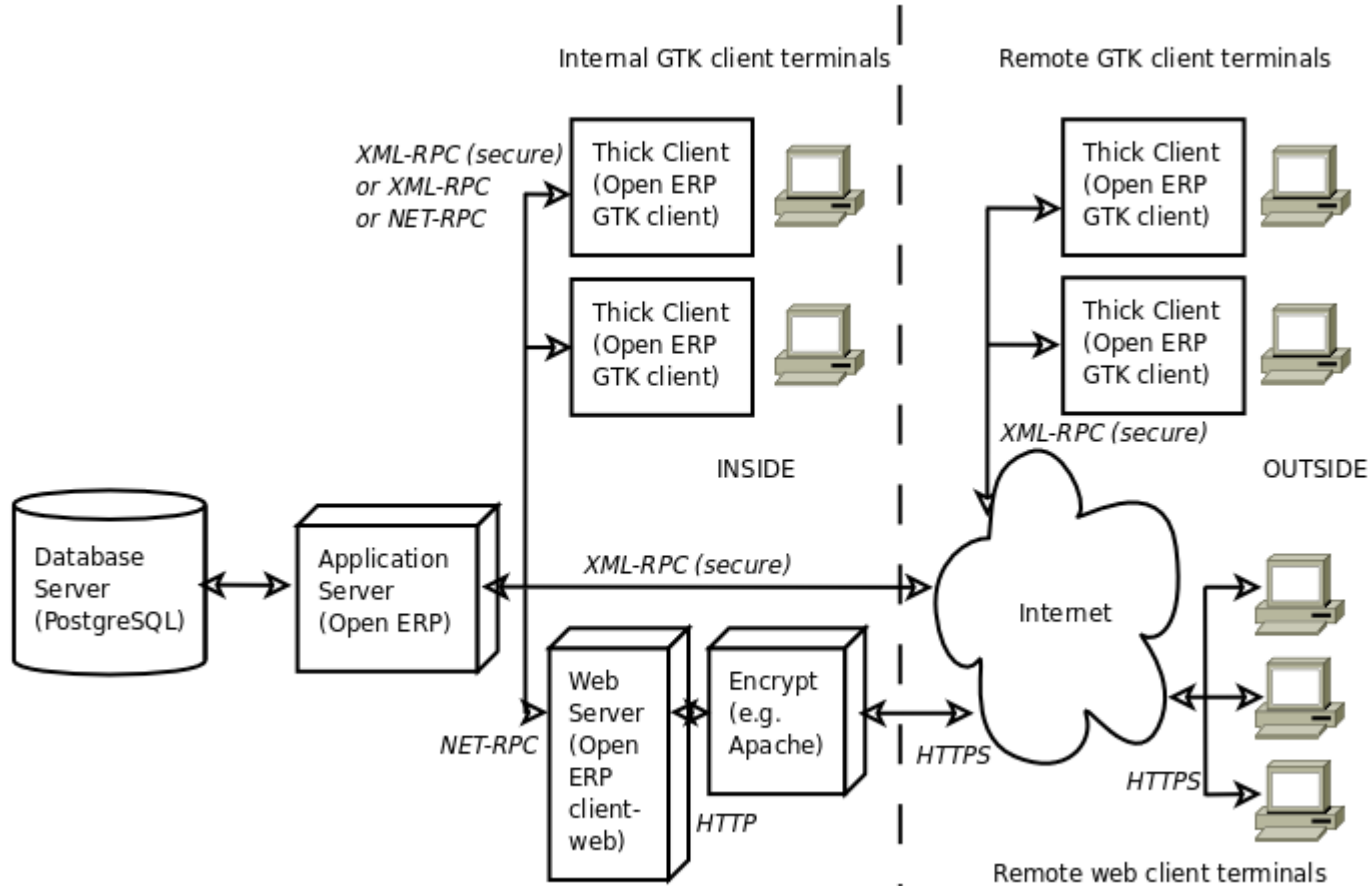


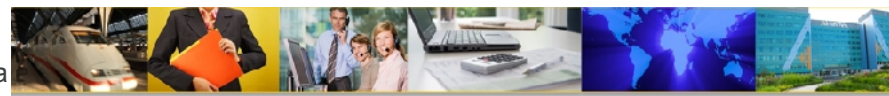
OpenERP è un software ERP OpenSource per la gestione delle piccole e medie imprese. OpenERP integra, tramite moduli, tutti i processi necessari all'impresa come contabilità, risorse umane, vendite, CRM, acquisti, gestione magazzino, produzione, servizi di gestione, gestione dei progetti, campagne di marketing, gestione documentale, wiki interno, report e altro ancora.

# Open ERP

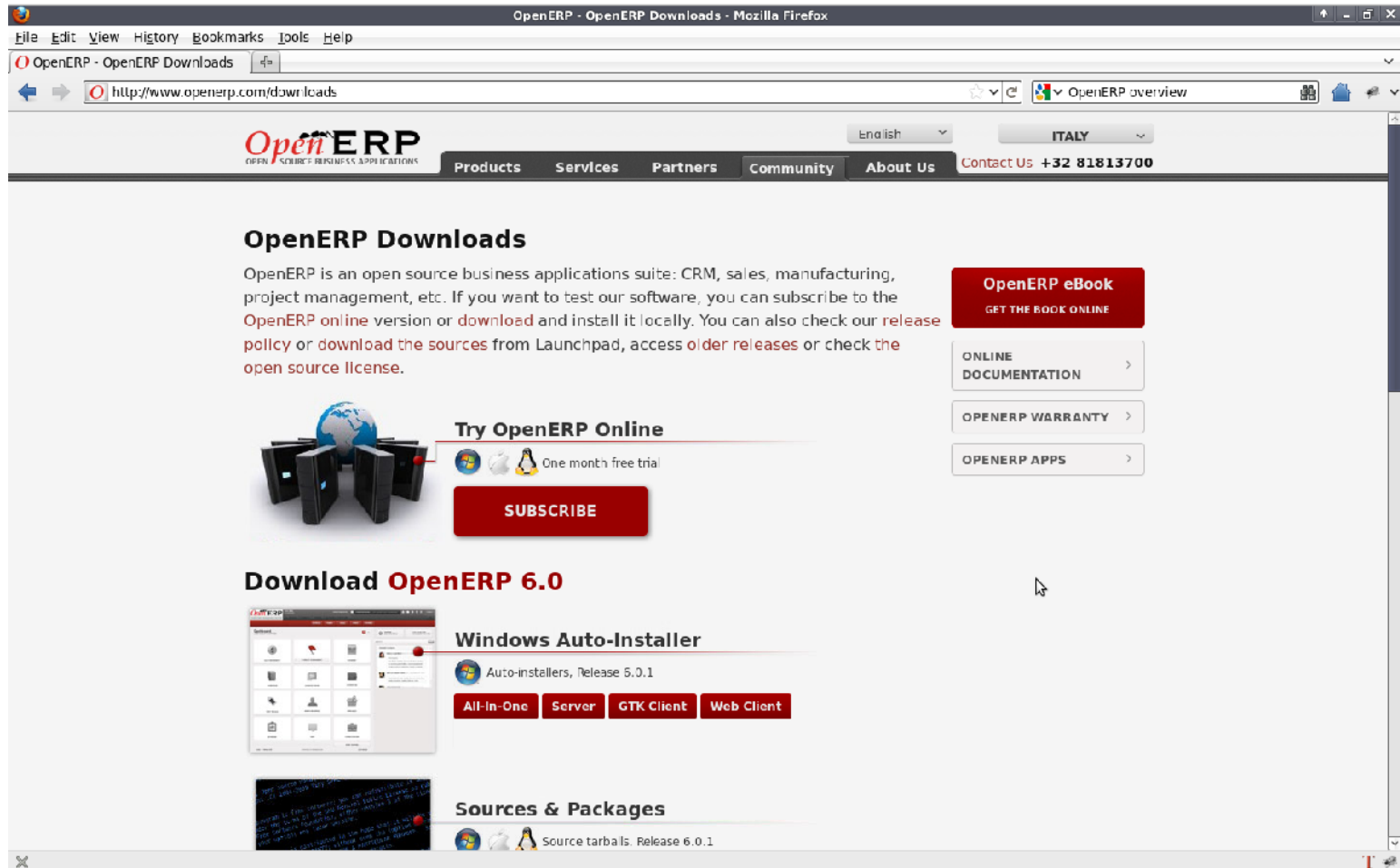


# Open ERP: Architettura



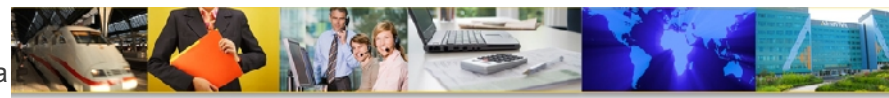


# Open ERP: Installazione

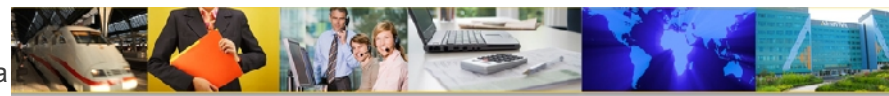
The screenshot shows the OpenERP website's 'Downloads' page. The browser window title is 'OpenERP - OpenERP Downloads - Mozilla Firefox'. The address bar shows 'http://www.openerp.com/downloads'. The website header includes the OpenERP logo, navigation menus for 'Products', 'Services', 'Partners', 'Community', and 'About Us', and a 'Contact Us +32 81813700' link. The main content area is titled 'OpenERP Downloads' and contains the following sections:

- OpenERP Downloads**: A paragraph describing OpenERP as an open source business applications suite (CRM, sales, manufacturing, project management, etc.) and providing links to the online version, download, release policy, sources, older releases, and open source license.
- OpenERP eBook**: A red button labeled 'GET THE BOOK ONLINE'.
- ONLINE DOCUMENTATION**: A button with a right-pointing arrow.
- OPENERP WARRANTY**: A button with a right-pointing arrow.
- OPENERP APPS**: A button with a right-pointing arrow.
- Try OpenERP Online**: A section featuring a globe icon, a 'One month free trial' offer, and a red 'SUBSCRIBE' button.
- Download OpenERP 6.0**: A section with a sub-heading 'Windows Auto-Installer' and a 'Release 5.0.1' label. It includes buttons for 'All-in-One', 'Server', 'GTK Client', and 'Web Client'.
- Sources & Packages**: A section with a 'Source tarballs, Release 6.0.1' label.

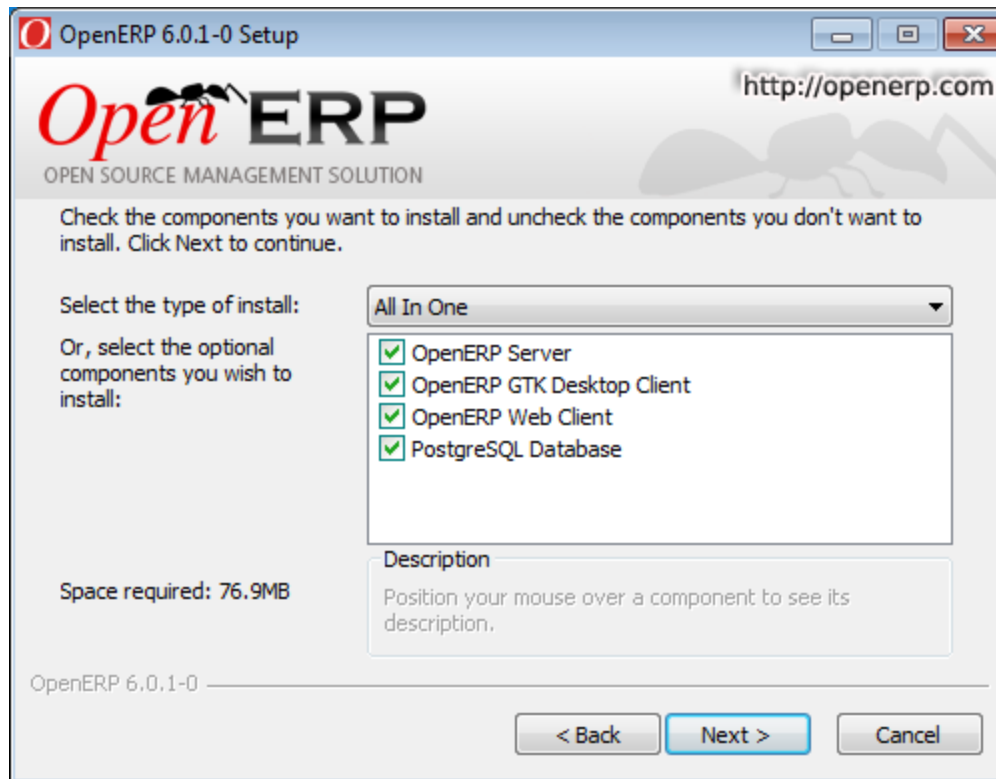
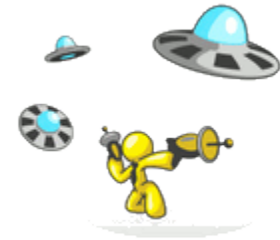


# Open ERP: Installazione

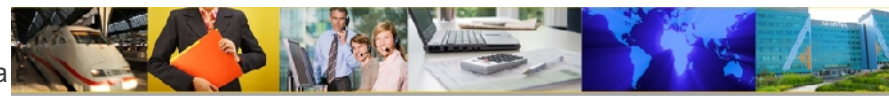




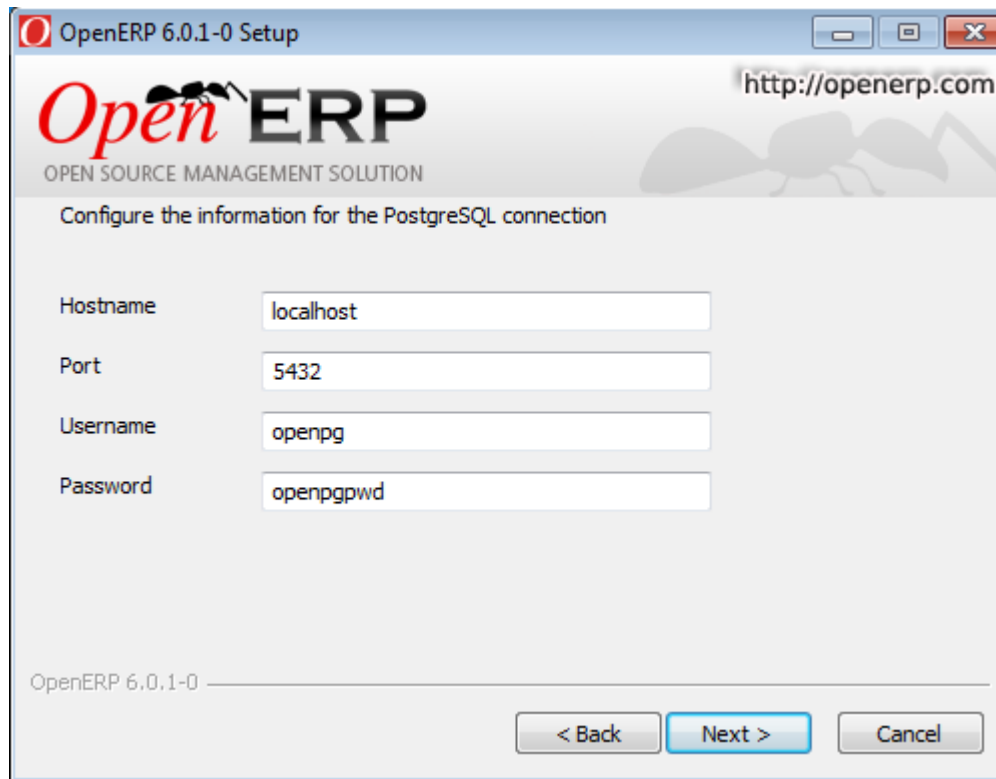
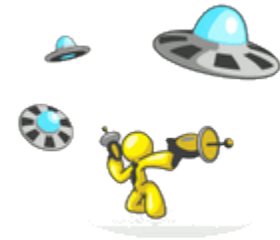
# Open ERP: Installazione







# Open ERP: Installazione



OpenERP 6.0.1-0 Setup

**Open ERP**  
OPEN SOURCE MANAGEMENT SOLUTION

<http://openerp.com>

Configure the information for the PostgreSQL connection

Hostname:

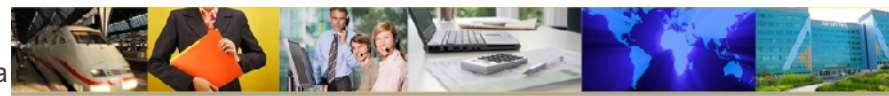
Port:

Username:

Password:

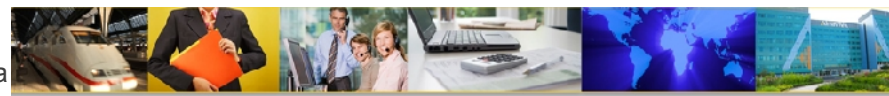
OpenERP 6.0.1-0

< Back   Next >   Cancel



# Open ERP: Installazione





# Open ERP: Login



File Edit View History Bookmarks Tools Help

**Open ERP**  
Made by *Tiny & Axelor*

Open ERP  
Open Enterprise Management Solution

Welcome guest Home Preferences About Logout

MAIN MENU SHORTCUTS

Developed by  
**Axelor & Tiny**

Welcome to OpenERP

Server: socket://localhost:8070

Database:

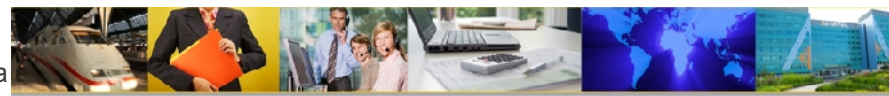
User:

Password:

Copyright © 2007-TODAY Tiny ERP Pvt. Ltd. All Rights Reserved. More Information on <http://openerp.com>.

The web client is developed by Axelor (<http://axelor.com>) and Tiny (<http://tiny.be>)

Running Server: socket://localhost:8070 - database: N/A



# Open ERP: Ordini



**Open ERP** TINY SPRL DASHBOARD FABIAN PINCKAERS 3 NEW MESSAGES LAST FROM MARIE ZILBERMAN LOGOUT

ALL MEETINGS PRODUCTS PARTNERS MY FIELDS OF COMPETENCE EDIT

SERVICES ADMIN SALES STOCK FINANCE

ACCOUNTING Global overview Sales orders Jobs and Careers New opportunities MEETINGS PHONE CALLS INVOICING

### Sales orders

ORDER REFERENCE NR. MEA50388

SAVE SAVE & NEW CANCEL 25 OF 130

ORDER REFERENCE CUSTOMER REF PICKED  
SELECTED SHOP ORDER DATE PAID

SALE ORDER OTHER DATA HISTORY

CUSTOMER ORDER CONTACT  
INVOICE ADDRESS SHIPPING ADDRESS  
PRICELIST ANALYTICS ACCOUNT

**Sale order lines** NEW 1-10 OF 130

DESCRIPTION	QTY	UOM	DISC.	UNIT	NET	TOTAL	DEL.
Cross-media scale quality supply chains processes services integrated	014	PCE	20 %	750	750	3,000	
Basic PC + assembly on order enthusiastically generate exceptional	253	PCE	50 %	500	500	3,000	
Dynamic enterprise synergistically quality supply chains processes	245	PCE	00 %	825	825	3,000	
Globally pursue client-centric cross-media art services	361	PCE	10 %	200	280	3,500	
Infomediaries scale functional results, process-centric vortals quality	118	PCE	20 %	250	320	5,500	
Process-centric vortals customize functional ideas rather than premier	232	PCE	50 %	500	440	2,250	
Integrated new deliverables reintermidiate multifunctional e-tailers	504	PCE	10 %	825	185	1,175	
Dynamic enterprise processes state of the art infrastructures	014	PCE	50 %	500	750	3,500	
Infomediaries scale quality infomediaries for cross-media services	253	PCE	25 %	320	500	5,500	

UNTAXED AMOUNT 117 TAXES 18 GRAND TOTAL 185 1-10 OF 130

CONFIRM CANCEL

SECONDARY OPTIONS

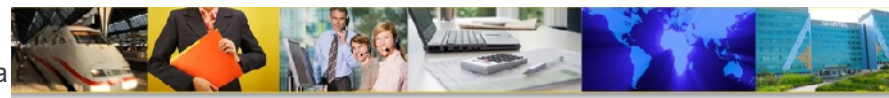
ACTIONS  
Send order via SMS  
Analyse current reminders

REPORTS  
Print all reminders  
Print all labels

RELATIONS  
Purchase existing orders  
Organize invoices

ATTACHMENTS CREATE ADD  
readme.txt  
dev\_guidelines.pdf  
IMG50254.JPG

LOGS TRANSLATE POWERED BY OPENERP.COM CUSTOMIZE



# Open ERP: Task



OPEN SOURCE MANAGEMENT SOLUTION

TINY SPRL DASHBOARD

FABIEN PINCKAERS

3 NEW MESSAGES LAST FROM MARIE ZILBERMAN

LOGOUT

ALL MEETINGS
PRODUCTS
PARTNERS
MY FIELDS OF COMPETENCE

SERVICES
ADMIN
PROJECTS
SALES
STOCK
FINANCE
EDIT PREFERENCES

PROJECT MANAGEMENT

Tasks

Bugs

Feature Requests

Specifications

Messages

TIME MANAGEMENT

PLANNING

FINANCIAL

SCRUM

REPORTING

CONFIGURATION

## Tasks

### BURNDOWN CHART

Week	Hours Remaining
7	500
6	480
5	420
4	368
3	250
2	180
1	80

### MESSAGES

**MARIE ZILBERMAN** WEDNESDAY 24 FEBRUARY 2010  
Hi everyone, Assertively redefine resource-leveling solutions via accurate potentialities. Quickly parallel task quality products rather than timely e-markets. Credibly fashion niche markets for global sources.

**JESSICA SARAH STONE** WEDNESDAY 24 FEBRUARY 2010  
Quickly parallel task quality products rather than timely e-markets. Credibly fashion niche markets for global sources.

**JOHNATHAN DOE** TUESDAY 23 FEBRUARY 2010  
That's right!

**SERGE AMORIZI** MONDAY 22 FEBRUARY 2010  
Thanks to all of you guys

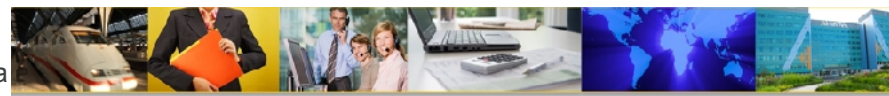
### ISSUES

Week	Opened	Closed
1	5	5
2	18	15
3	25	22
4	38	35
5	42	38
6	52	45
7	55	50

### LATEST LOGS

NAME	AGE	NICKNAME	EMPLOYEE
Johnathan Doe	34	John	✓
Paul Bishop Newshire	24		📧
Paolo Del Monte	35	PDM	📧
Marie Zilberman	31	Maria	📧
Jessica Sarah Stone	18		✓
Paul-Henri de la Vallée Roubaix	52	Paul Roubaix	📧
Serge Amorizi	48		✓
Johnathan Doe	34	John	📧
Paul Bishop Newshire	24		📧
Paolo Del Monte	35		📧

LOGS
TRANSLATE
POWERED BY OPENERP.COM
CUSTOMIZE



# Open ERP: Calendario



**Open ERP** TINY SPRL DASHBOARD FABIAN PINCKAERS 3 NEW MESSAGES LAST FROM MARIE ZILBERMAN LOGOUT

ALL MEETINGS PRODUCTS PARTNERS MY FIELDS OF COMPETENCE EDIT

SERVICES ADMIN SALES STOCK FINANCE

ACCOUNTING MEETINGS Global overview **Calendar Meetings** Feedbacks PHONE CALLS INVOICING

## Calendar Meetings

MONTH WEEK DAY TODAY

22 to 28 February (Week 9)

MON 22 FEB	TUE 23 FEB	WED 24 FEB	THU 25 FEB	FRI 26 FEB	SAT 27 FEB	SUN 28 FEB
8:00 Enforcir		Fully tested meta-services				
9:00 Expanded Array	9:00 Core Competencie					
	12:30 Manufacture products core					
				14:00 Syndicate One-To-One Sources	14:30 Proof Convergent	
16:00 Niche Marke	16:00 Instal Base					

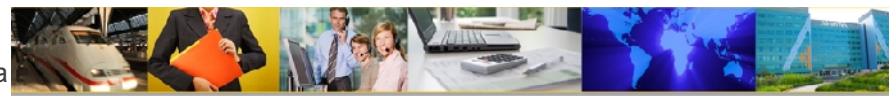
NAVIGATOR JULY 2010

28	29	30	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1

RESPONSIBLE ADD

- Johnathan Doe
- Paul Bishop Newshire
- Paolo Del Monte
- Marie Zilberman
- Jessica Sarah Stone
- P. De La Vallée Roubaix
- Serge Amorizi

LOGS TRANSLATE POWERED BY OPENERP.COM CUSTOMIZE



# Open ERP: Calendario



**Open ERP** TINY SPRL DASHBOARD FABIAN PINCKAERS 3 NEW MESSAGES LAST FROM MARIE ZILBERMAN

ALL MEETINGS PRODUCTS PARTNERS MY FIELDS OF COMPETENCE EDIT

SERVICES ADMIN SALES STOCK FINANCE

ACCOUNTING MEETINGS Global overview **Calendar Meetings** Feedbacks PHONE CALLS INVOICING

### Calendar Meetings

MONTH WEEK DAY TODAY

February 2010

MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
1	2 • Enforcing equal • Expanded array	3 <b>Conveniently impact</b> • Holisticly engineer installed • Enforcing equal	4	5	6 • Installed base	7 • Enforcing equal
8 <b>Conveniently impact</b> • Enforcing equal • Expanded array	9 • Enforcing equal	10	11	12	13	14
15	16	17	18 <b>Manufactured products core</b> • Enforcing equal • Expanded array • Niche markets • Installed base • Core competenc • Restructuration + 2 MORE	19 • Interactive en • Installed base	20	21
22 • Enforcing equal • Expanded array • Niche markets • Installed base	23 • Installed base • Core competenc	24 TODAY <b>Fully tested meta-services</b>	25	26 • Enforcing equal	27 • Installed base	28

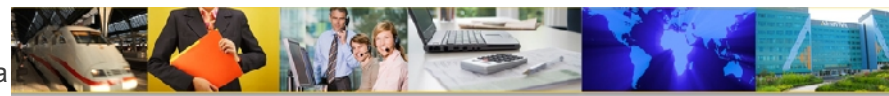
NAVIGATOR JULY 2010

28	29	30	1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	1

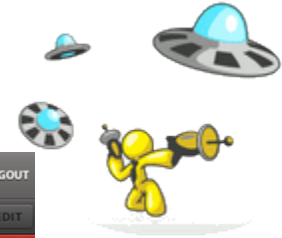
RESPONSIBLE ADD

- Johnathan Doe
- Paul Bishop Newshire
- Paolo Del Monte
- Marie Zilberman
- Jessica Sarah Stone
- P. De La Vallée Roubaix
- Serge Amorizi

LOGS TRANSLATE POWERED BY OPENERP.COM CUSTOMIZE



# Open ERP: Partners



**Open ERP** TINY SPRL DASHBOARD FABRIEN PINCKAERS 3 NEW MESSAGES LAST FROM MARIE ZILBERMAN LOGOUT

ALL MEETINGS PRODUCTS PARTNERS MY FIELDS OF COMPETENCE EDIT

SERVICES ADMIN SALES STOCK FINANCE

ACCOUNTING  
Global overview  
Sales orders  
Jobs and Careers  
New opportunities

MEETINGS  
PHONE CALLS  
ADDRESS BOOK  
INVOICING  
REPORTS  
CONFIGURATION

## Partners

PRODUCTS SERVICES NAME SALESMAN

GROUP BY

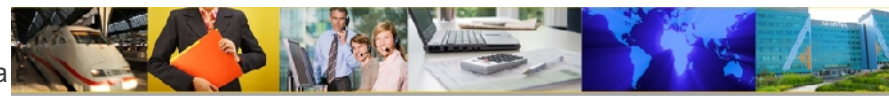
FILTER CLEAR CUSTOM FILTERS

**Partners list** NEW 1-40 OF 120

	NAME	AGE	NICKNAME	EMPLOYEE	
	Johnathan Doe	34	John	<input checked="" type="checkbox"/>	
	Paul Bishop Newshire	24			
	Paolo Del Monte	35	PDM		
	Marie Zilberman	31	Maria		
	Jessica Sarah Stone	18		<input checked="" type="checkbox"/>	
	Paul-Henri de la Vallée Roubaix	52	Paul Roubaix		
	Serge Amorizi	48		<input checked="" type="checkbox"/>	
	Johnathan Doe	34	John		
	Paul Bishop Newshire	24			
	Paolo Del Monte	35		<input checked="" type="checkbox"/>	
	Marie Zilberman	31	Maria		
	Jessica Sarah Stone	25	J.C.	<input checked="" type="checkbox"/>	
	Paul-Henri de la Vallée Roubaix	52	Gribouille		
	Serge Amorizi	48		<input checked="" type="checkbox"/>	
	Johnathan Doe	34	John		
	Paul Bishop Newshire	24			
	Paolo Del Monte	35			
<b>TOTAL</b>		468			

TRANSLATE | IMPORT | EXPORT POWERED BY OPENERP.COM CUSTOMIZE





# Open ERP: Dashboard



**Open ERP** OPEN SOURCE MANAGEMENT SOLUTION

TINY SPRL DASHBOARD FABIAN PINCKAERS 3 NEW MESSAGES LAST FROM MARIE ZILBERMAN

ALL MEETINGS PRODUCTS PARTNERS MY FIELDS OF COMPETENCE

SERVICES ADMIN SALES STOCK FINANCE

**Dashboard** CHIEF EXECUTIVE OFFICER

UPGRADE NEW VERSION 6.2 CALL TO ACTION SECONDARY TEXT LINE

WIDGETS ADD

OPENERP FEEDBACK

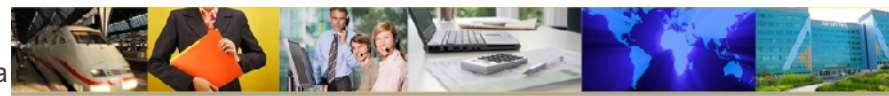
MARIE ZILBERMAN WED, 24 FEBRUARY 2010  
Hi everyone, Assertively redefine resource-leveling solutions via accurate potentialities. Quickly parallel task quality products rather than timely e-markets.

JESSICA SARAH STONE WED, 24 FEBRUARY 2010  
Quickly parallel task quality products rather than timely e-markets. Credibly fashion niche.

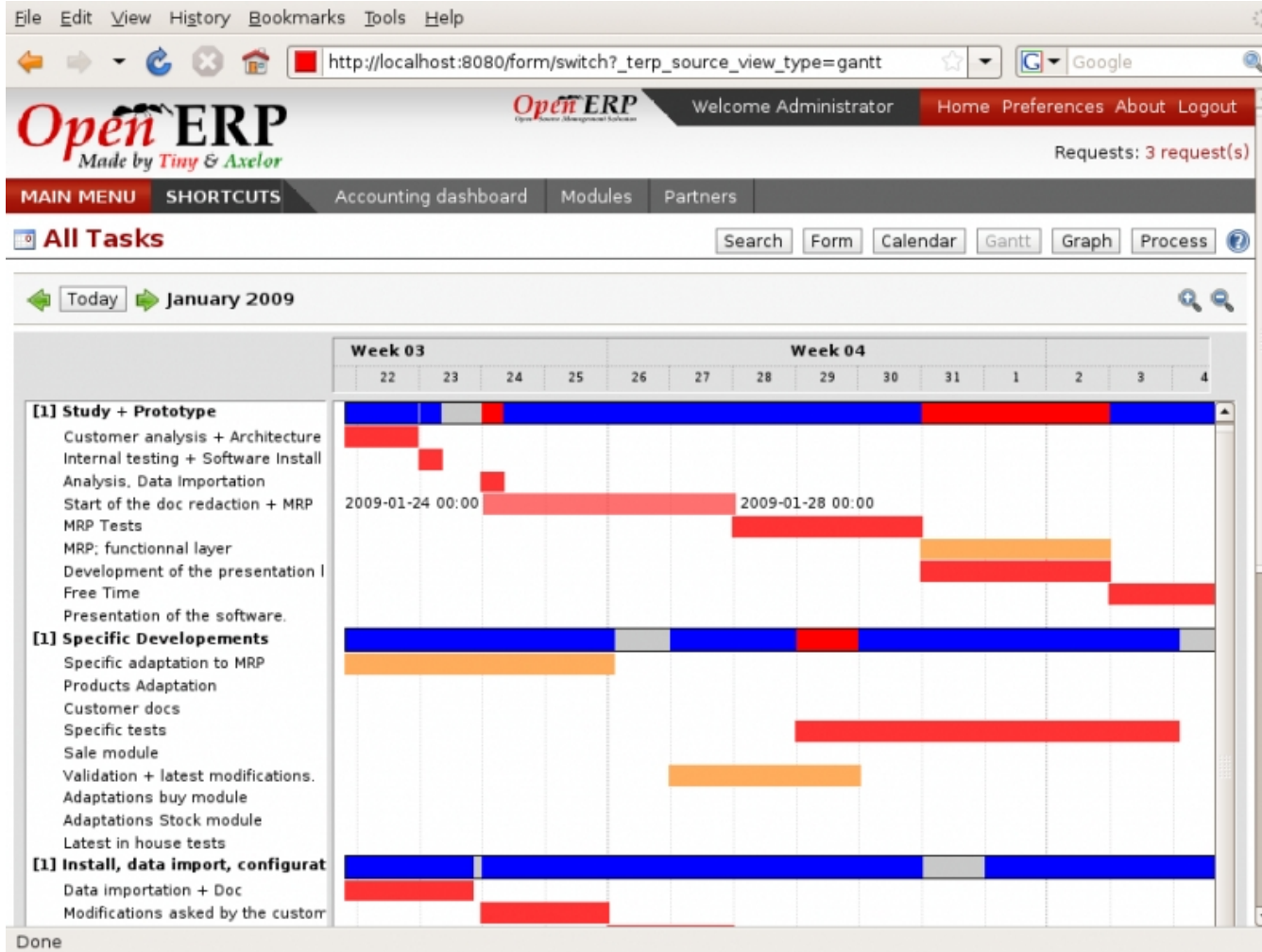
LOUNTHAN DOE THURSDAY 25 FEBRUARY 2010

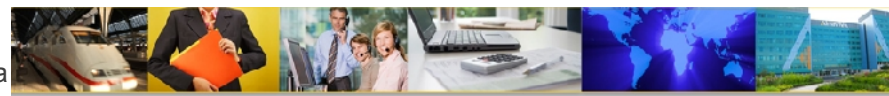
SALES DEPARTMENT TO PROJECT MANAGEMENT INVENTORY KNOWLEDGE MANUFACTURING ACCOUNTING POINT OF SALE HUMAN RESOURCES PURCHASES REPORTING CHAT ADMINISTRATION MORE FEATURES

LOGS TRANSLATE POWERED BY OPENERP.COM CUSTOMIZE



# Open ERP: Pianificazione dei task

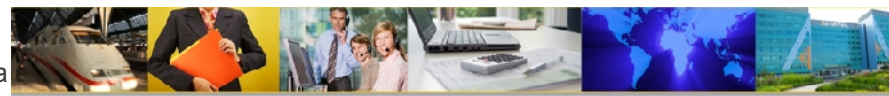




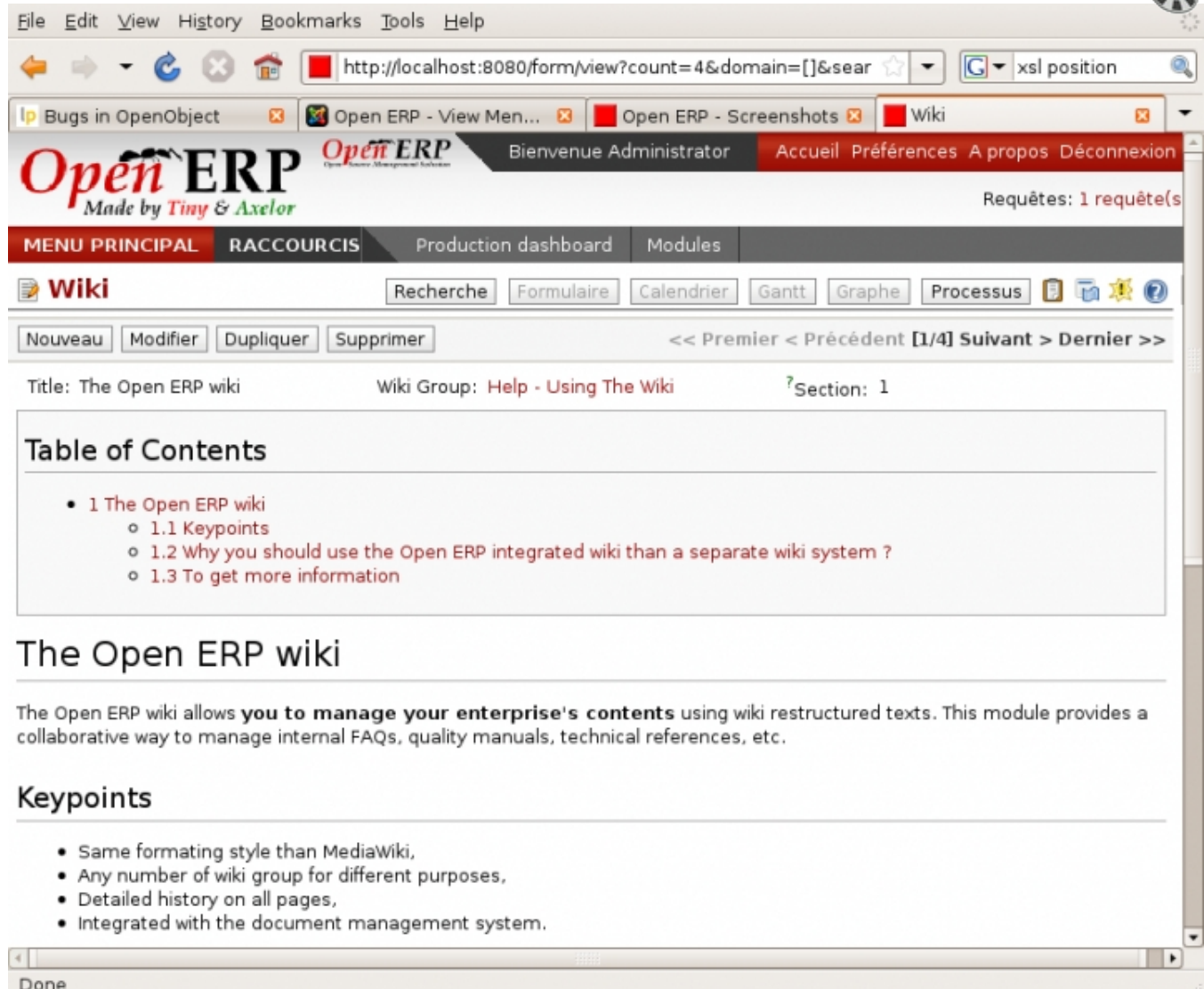
# Open ERP: Menu principale



The screenshot shows a Mozilla Firefox browser window displaying the Open ERP main menu. The browser's address bar shows the URL: `http://localhost:8080/tree?id=78&model=ir.ui.menu&view_id=1&domain=[('par`. The page header includes the Open ERP logo, the text "Made by Tiny & Axelor", and a navigation bar with "Welcome Administrator", "Home", "Preferences", "About", and "Logout". Below the header, there are tabs for "MAIN MENU" and "SHORTCUTS", and a "Production dashboard" link. The main content area is titled "Menu" and features a "Toolbar" on the left with icons for Partners, Dashboards, Products, Human Resources, Financial Management, Stock Management, Purchase Management, Manufacturing, Sales Management, CRM & SRM, Project Management, and Administration. The main menu area on the right lists "Configuration", "Partners", and "Partner Addresses". The status bar at the bottom of the browser window shows "Done".



# Open ERP: Wiki

File Edit View History Bookmarks Tools Help

http://localhost:8080/form/view?count=4&domain=[]&sear

Bugs in OpenObject Open ERP - View Men... Open ERP - Screenshots Wiki

**Open ERP** Made by Tiny & Axelor

Bienvenue Administrator Accueil Préférences A propos Déconnexion

Requêtes: 1 requête(s)

MENU PRINCIPAL RACCOURCIS Production dashboard Modules

Wiki Recherche Formulaire Calendrier Gantt Graphe Processus

Nouveau Modifier Dupliquer Supprimer << Premier < Précédent [1/4] Suivant > Dernier >>

Title: The Open ERP wiki Wiki Group: Help - Using The Wiki Section: 1

## Table of Contents

- 1 The Open ERP wiki
  - 1.1 Keypoints
  - 1.2 Why you should use the Open ERP integrated wiki than a separate wiki system ?
  - 1.3 To get more information

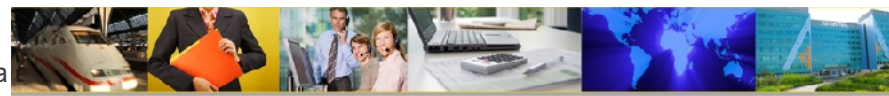
## The Open ERP wiki

The Open ERP wiki allows **you to manage your enterprise's contents** using wiki restructured texts. This module provides a collaborative way to manage internal FAQs, quality manuals, technical references, etc.

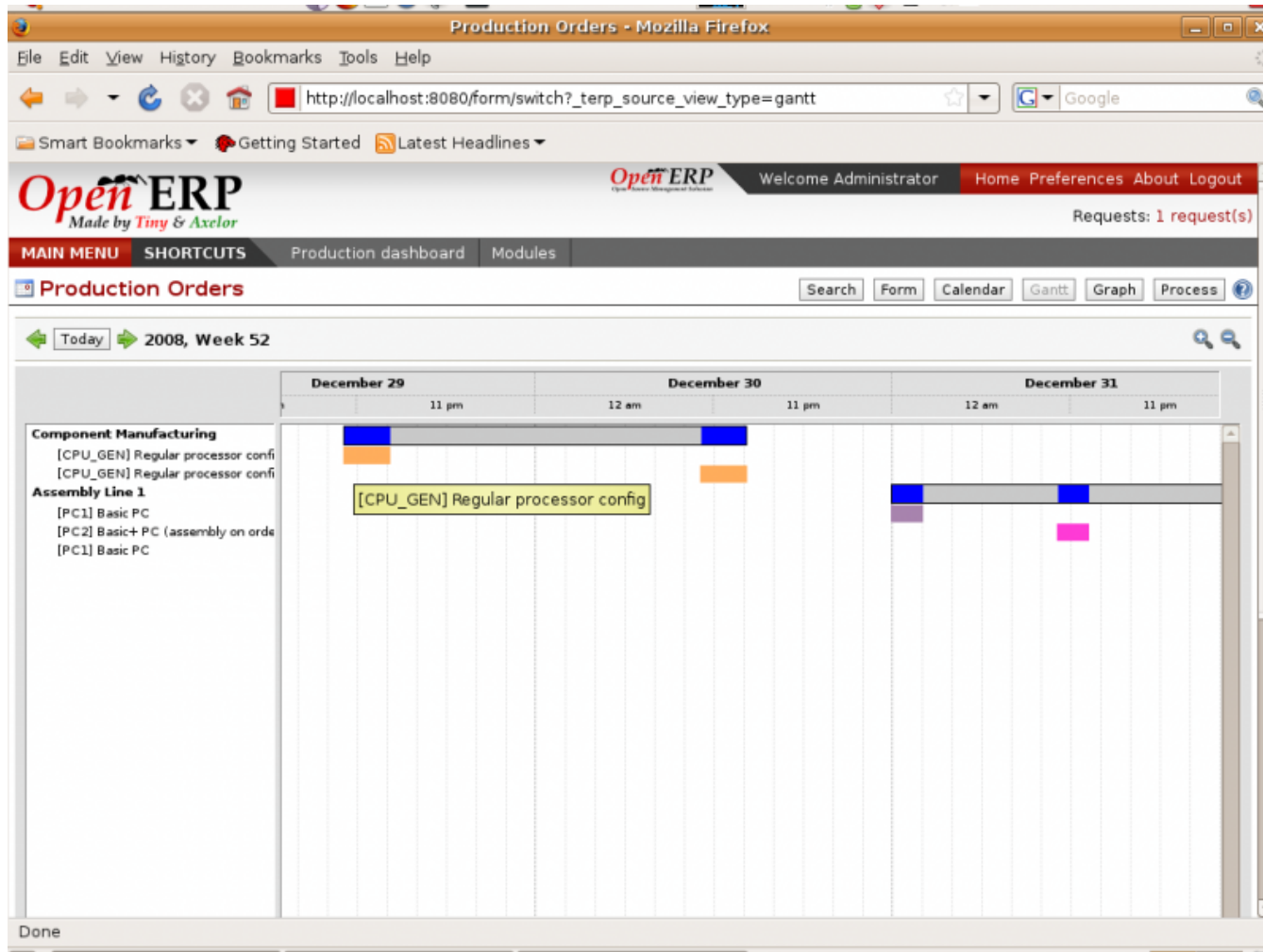
## Keypoints

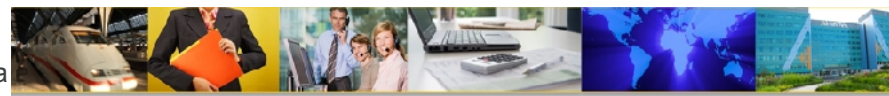
- Same formatting style than MediaWiki,
- Any number of wiki group for different purposes,
- Detailed history on all pages,
- Integrated with the document management system.

Done

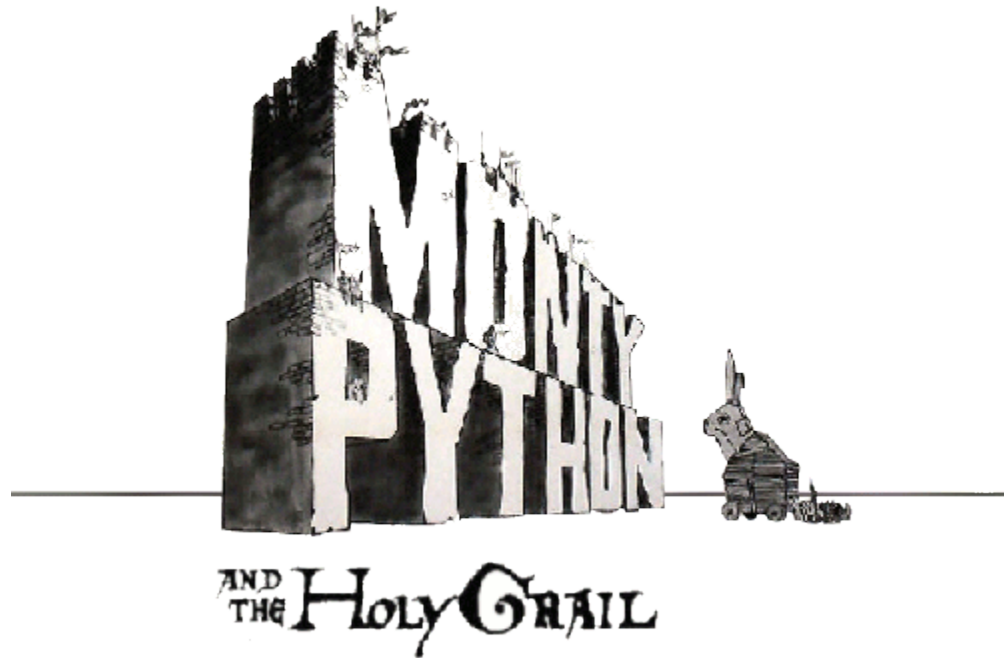


# Open ERP: Gantt

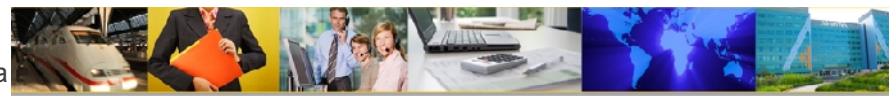




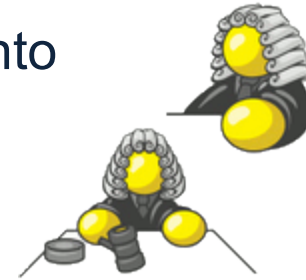
# Open ERP: personalizzazione con Python



Python è un linguaggio di programmazione ad alto livello, orientato agli oggetti, adatto, tra gli altri usi, per sviluppare applicazioni distribuite, scripting, computazione numerica e system testing. Python è spesso paragonato a Tcl, Perl, Java, JavaScript, Visual Basic o Scheme. Fu ideato da Guido van Rossum all'inizio degli anni novanta. Il nome fu scelto per via della passione di van Rossum per i Monty Python e per la loro serie televisiva Monty Python's Flying Circus

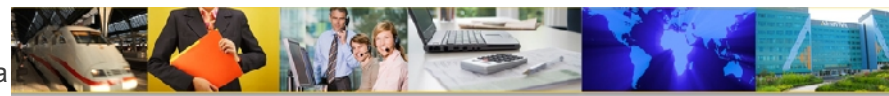


# Python: la programmazione come arte e divertimento



Beautiful is better than ugly.  
 Explicit is better than implicit.  
 Simple is better than complex.  
 Complex is better than complicated.  
 Flat is better than nested.  
 Sparse is better than dense.  
 Special cases aren't special enough to break the rules.  
 Errors should never pass silently.  
 Now is better than never.

*Tim Peters*



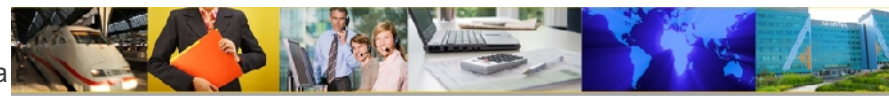
# Python: il fattoriale

```
def fattoriale(x):
    if x < 2:
        return 1
    else:
        return x * fattoriale(x-1)
```



```
Terminal - anzidei@operation-research-station: ~
File Edit View Terminal Go Help
panzidei@operation-research-station:~$ python
Python 2.6.5 (r265:79063, Apr 16 2010, 13:09:56)
[GCC 4.4.3] on linux2
Type "help", "copyright", "credits" or "license" for more information.
>>> def fattoriale(x):
...     if x < 2:
...         return 1
...     else:
...         return x * fattoriale(x-1)
...
>>> fattoriale (6)
720
>>> fattoriale (42)
1405006117752879898543142606244511569936384000000000L
>>> █
```



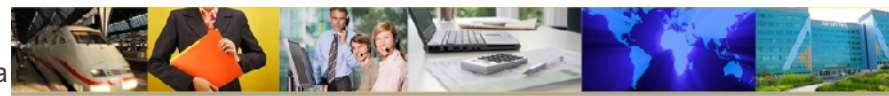


# City Logistics



Taniguchi ed altri hanno definito la City Logistics come “the process for totally optimising the logistics and transport activities by private companies in urban areas while considering the traffic environment, the traffic congestion and energy consumption within the framework of a market economy.”



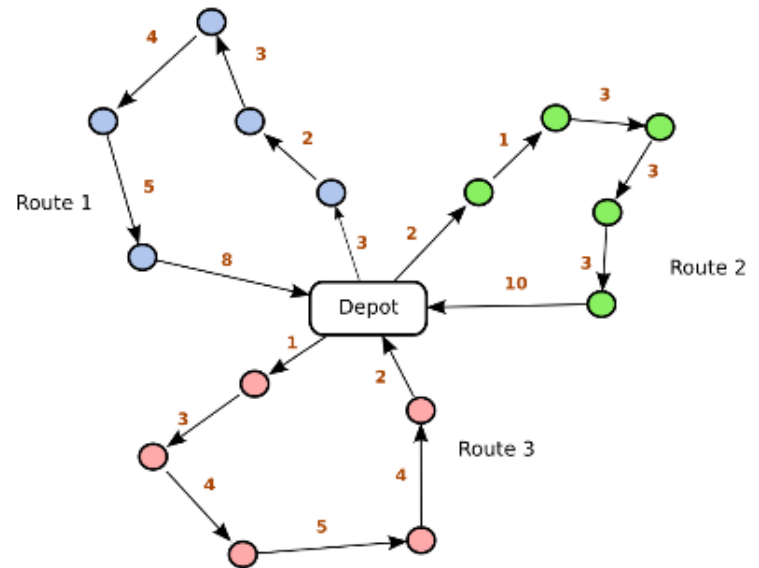


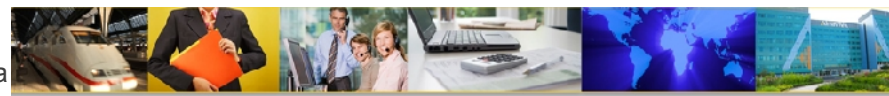
# City Logistics: il Vehicle Routing Problem with Time Windows



Nell'ambito della Ricerca Operativa Taniguchi ha individuato nel problema VRPTW (Vehicle Routing Problem with Time Windows) il problema di ottimizzazione la cui soluzione è il cuore matematico di un sistema di City Logistics.

Il VRPTW è un problema **NP-Hard** e come tale non può essere risolto in maniera ottimale ma solo affrontato tramite euristiche



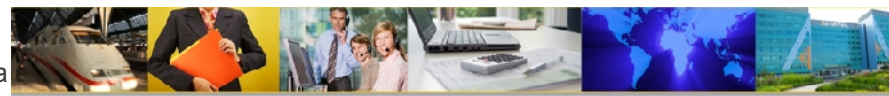


# City Logistics: un contenitore degli algoritmi di ottimizzazione



L'introduzione di un sistema di City Logistics da parte di una amministrazione locale coincide molto spesso con la creazione di una società di servizi, privata o pubblicamente partecipata, che ha responsabilità dell'erogazione del servizio





# City Logistics: Integrazione OpenERP (Google Maps)



from:VIA DELL'OSMANNORO 230 SESTO FIORENTINO Italia 50019 to:VIA  
Cerca sulle mappe Mostra opzioni di ricerca

Trova attività commerciali, indirizzi e luoghi di interesse.

**Indicazioni stradali** [Le mie mappe](#)

- A VIA DELL'OSMANNORO 230 SESTO FIORENTINO
- B VIA DEL PALAZZO DEI DIAVOLI 3 FIRENZE Itali
- C VIA DANTE 125 SCANDICCI Italia 50018
- D VIA DELL'OSMANNORO 230 SESTO FIORENTINO

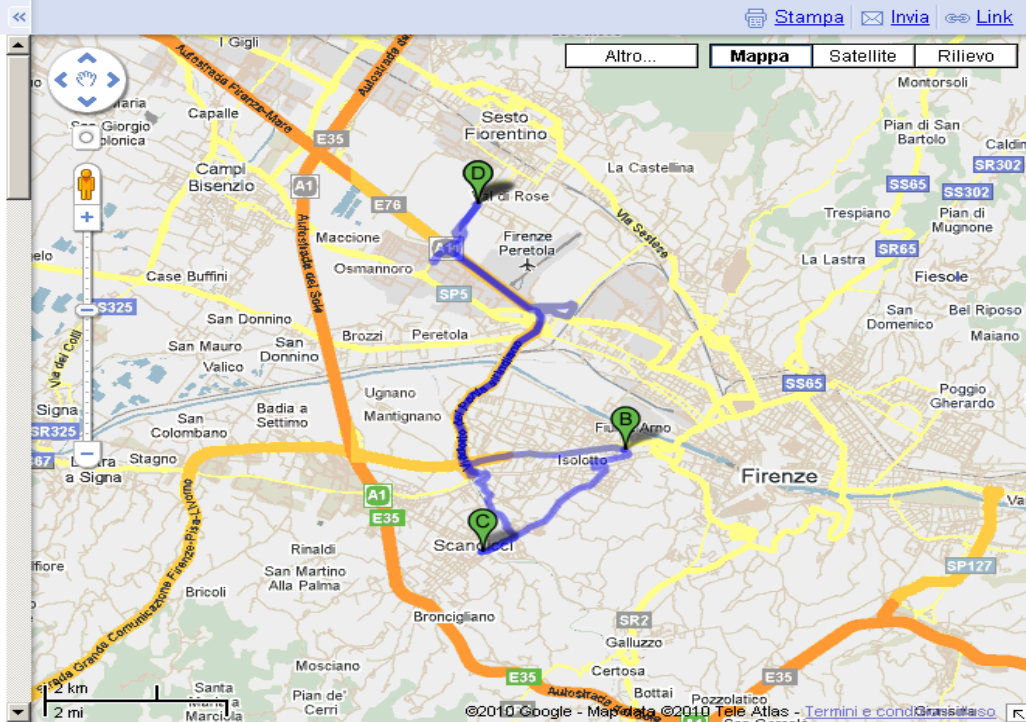
[Aggiungi destinazione](#) - [Mostra opzioni](#)

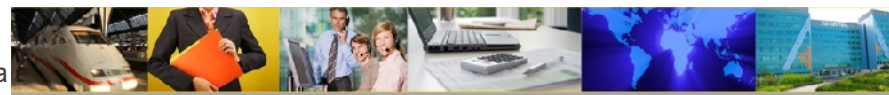
Auto

Ottieni indicazioni stradali

**Indicazioni stradali per Via dell'Osmannoro, 230, 50019 Sesto Fiorentino FI**  
26,6 km – circa 47 min

- 1. Procedi in direzione **sudovest** su **Via dell'Osmannoro** 0,7 km
- 2. Svolta leggermente a **sinistra** per rimanere su **Via dell'Osmannoro** 0,5 km
- 3. Continua su **Via del Cantone** 0,3 km
- 4. Svolta a **sinistra** per rimanere su **Via del Cantone** 19 m
- 5. Svolta a **sinistra** in **Via Tevere** 19 m

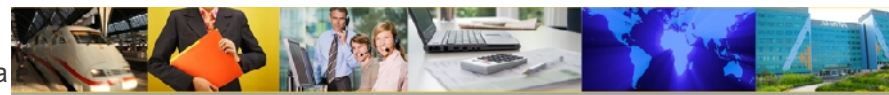




# City Logistics: Personalizzazione OpenERP (Urbis Ratio)



URBIS  RATIO  
UN PRODOTTO CITY LOGISTICS DI 



# City Logistics: Personalizzazione OpenERP (Clienti)



MAIN MENU SHORTCUTS Modules [ADV]

Partner [SEARCH] [EDIT] [Calendar] [Mail] [Graph] [Print]

Basic Search / Advanced Search

Nome: \_\_\_\_\_ Codice: \_\_\_\_\_  
 Indirizzo: \_\_\_\_\_ Contatti: \_\_\_\_\_

[Filter] [Print] [Fit] [New]

< First < Previous [1 45 of 45] Next > Last >>

<input type="checkbox"/>	Nome	Qualifica	Codice	Città	Nazione	Lingua	
<input type="checkbox"/>	ANTICO CIVAILO		0007	FIRENZE	Italy	Italian / Italiano	X
<input type="checkbox"/>	BOTTEGA DELLA FRUTTA		0001	FIRENZE	Italy	Italian / Italiano	X
<input type="checkbox"/>	CASA DELLA FRUTTA SNC		0006	FIRENZE	Italy	Italian / Italiano	X
<input type="checkbox"/>	CENTRO ALIMENTARE POLIVALENTI		M000	FIRENZE	Italy	Italian / Italiano	X
<input type="checkbox"/>	CENTRO FRUTTA SRL		M001	FIRENZE	Italy	Italian / Italiano	X
<input type="checkbox"/>	DOLYMA DOLMARI FIRENZE SRL		M003	FIRENZE	Italy	Italian / Italiano	X
<input type="checkbox"/>	EDERON		0010	FIRENZE	Italy		X
<input type="checkbox"/>	FILTRALTO S.P.A.		T003	FIRENZE	Italy	Italian / Italiano	X
<input type="checkbox"/>	EFELION		0010	FIRENZE	Italy		X
<input type="checkbox"/>	FON ARRE (SAS)		0001	FIRENZE	Italy	Italian / Italiano	X
<input type="checkbox"/>	FRATELLI CAS		M002	CAMPORISTORTO, FIRENZE	Italy	Italian / Italiano	X
<input type="checkbox"/>	GLOBAL LOGISTIC SOLUTIONS TSF	Corp.	TSF	FIRENZE	Italy	Italian / Italiano	X
<input type="checkbox"/>	GRANDI & PICCINI ORTOFRUTTA		0000	FIRENZE	Italy	Italian / Italiano	X
<input type="checkbox"/>	IL VINO		0010	FIRENZE	Italy		X
<input type="checkbox"/>	HEROSHIVA		0013	FIRENZE	Italy		X
<input type="checkbox"/>	HOTEL DELTA FLORENCE		F006	FIRENZE	Italy	Italian / Italiano	X
<input type="checkbox"/>	HOTEL HILTON		KJ00	FIRENZE	Italy	english	X
<input type="checkbox"/>	ICITA		0010	FIRENZE	Italy		X
<input type="checkbox"/>	IACARTA		0013	FIRENZE	Italy		X
<input type="checkbox"/>			0013	FIRENZE			X

REPORTS  
 Etichette  
 Overdue Payments  
 ACTIONS  
 Struttura Azienda  
 Una tabella delle distanze  
 Invia SMS  
 Mailing di Massa  
 LINKS  
 Invasi & Pagamenti  
 Indici d'Arresto  
 Vendite  
 Righe contabilità  
 Eventi  
 Fatture

http://10.228.16.135:8080/erp/erp?mod=+...&id=6



# City Logistics: Personalizzazione OpenERP (Prodotti)



MAIN MENU SHORTCUTS Modules

**Prodotti** Search Import Calendar Export Graph Refresh

Basic Search Advanced Search

Nome:  Area:   
 EAN13:  Categorie:   
 Margine Variante di Prezzo:  Extra Variante di Prezzo:

Filter Delete Edit New

<< First < Previous | 1 - 45 of 45 | Next > Last >>

Codice	Nome	Targa	Varianti	UM predifinita	Stock Reale	Stock Virtuale	EAN13	Stato	Prezzo di Vendita	Prezzo di Costo	
PC006	POMPE ME	SUD AFRICA		BOX	5,00	5,00	0780201320604		1,00	1,00	X
PC002	ARANCE	VALENCIA		CASSETTE	10,00	10,00			1,00	1,00	X
PC004	CLEVERLINE	MARSA		CASSETTE	1,00	1,00			1,00	1,00	X
PC005	LIMONE	EUREKA		VASCHEFFE	1,00	1,00			1,00	1,00	X
PC008	ARANCE	SICILIA		BOX	1,00	1,00			1,00	1,00	X
PC007	ANANAS	COSTARICA		PCE	1,00	1,00			1,00	1,00	X
PC001	ANANAS	PAVILL		CASSETTE	11,00	11,00			1,00	1,00	X
PC008	BANANE	COSTARICA		PCE	1,00	1,00			1,00	1,00	X
PC009	FRAGOLE	PRIMA SCEFFA		VASCHEFFE	3,00	3,00	0780201320655		1,00	1,00	X
PC010	LAMPONI	IN VASCHEFFA		VASCHEFFE	3,00	3,00			1,00	1,00	X
PC011	MELE	GOLDEN DELICIOUS		CASSETTE	1,00	1,00			1,00	1,00	X
PC012	PERE			CASSETTE	3,00	3,00			1,00	1,00	X
PC013	ANGURIA	BIANCA		VASCHEFFE	3,00	3,00			1,00	1,00	X

REPORTS

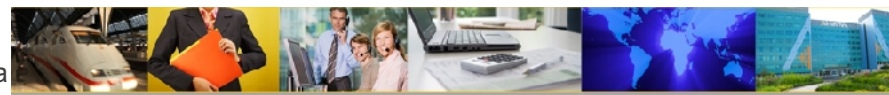
- Lista Prezzi
- Etichette Prodotti
- Struttura Costo Prodotto
- Future Stock Forecast

ACTIONS

- Replenishment Request

LINKS

- Vendita Prodotto
- Struttura Distinta Base Prodotto
- Distinta Base
- Future Stock Moves
- Condizioni Stock Minimo
- Stock by Location
- Stock by Lots
- All Stock Moves



# City Logistics: Personalizzazione OpenERP (Ordini)



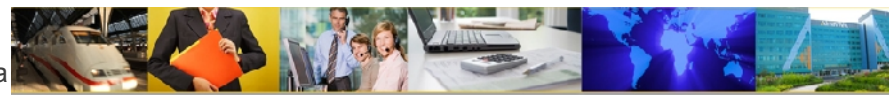
MAIN MENU SHORTCUTS Modules

Menu

Toolbar	Menu
Gestione stock	▸ Configurazione
Partner	▸ Incassabilità
Dashboard	▸ Automatic Procurements
Product	▸ Periodic Inventory
Gestione Ordine	▸ Times Limitations Structure
Gestione Finanziaria	▸ Reportistica
Gestione Project	▸ Marketing & Promoz.
Gestione Acquisti	▸ Training Programs
Manufacturing	▸ Training Modules
Gestione Vendita	▸ Catalog & Products
HR Manager	▾ Ordini di Consegna
Amministrazione	▫ Ordini di Consegna da Processare
	▫ Future Delivery Orders
	▫ Calendar of Deliveries
	▫ Lista delle consegne

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The web client is developed by Axelent (<http://axelent.com>) and Tivix (<http://tivix.be>).  
Running Server: socket://localhost:3070 - database: Firenze





# City Logistics: Personalizzazione OpenERP (Liste di Consegna)



MAIN MENU SHORTCUTS Modules [ADD]

**Lista delle consegne** [Refresh] [Filter] [Calendar] [Print] [Export] [Process]

Basic Search Advanced Search

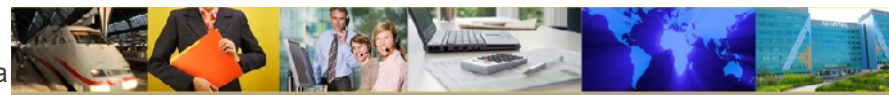
File Delete ELL New

REPORTS  
Stampa la sequenza delle consegne

ACTIONS  
Mostra il percorso

<< First < Previous [1 - 65 of 65] Next > Last >>

<input type="checkbox"/>	Stato	Camionista	Progressiva	Indirizzo	Città	Merce	
<input type="checkbox"/>	in consegna	Camion 1	1	Via Albertelli 12	E. Bordini	1,0 G.acca	X
<input type="checkbox"/>	in consegna		2	Strada Cavallotti	I. Fontana	3,0 Pane	X
<input type="checkbox"/>	in consegna		3	VIA IMPERIA 20	FERFARI ANNA	3,0 Camicie	X
<input type="checkbox"/>	in consegna		4	STRADA Mazzini 5/a	UPIM	7,0 Camicie	X
<input type="checkbox"/>	in consegna		5	STRADA Mazzini	Giacomazzi SPL - Mazzini	1,0 G.acca	X
<input type="checkbox"/>	consegnato		6	VIA RIBELLETTA 37	FIXER SNC	1,0 Ornedio	X
<input type="checkbox"/>	in consegna	Camion 2	1	Strada De. Mercati 17	CONSORZIO AL FARIO DI FARMA SOD. COOP. A.R.L.	2,0 Pane	X
<input type="checkbox"/>	in consegna		4	Dorco della Lavallezza 7/a	La Dolciana	1,0 Mele	X
<input type="checkbox"/>	in consegna		3	Via Albertelli 12	Mirimarket - Yanzdor	2,0 Pecorino	X
<input type="checkbox"/>	in consegna		4	Strada mazzini 5/a	Frenatal	3,0 Camicie	X
<input type="checkbox"/>	in consegna					1,0 Canna	X
<input type="checkbox"/>	in consegna					2,0 G.acca	X
<input type="checkbox"/>	in consegna		5	VIA FERRARINI F	FANTOVANI REFFETTI LUCIA	2,0 Schmir	X



# City Logistics: Personalizzazione OpenERP (Percorso)



Lista delle consegne da Strada dei Mercati, 9, 4...

http://maps.google.it/maps?q=&saddr=++STRADA+DEI+MERCATI+9+PARMA+Italia+43100&daddr=+Via+Albertelli+12+PARMA

Web Immagini Video Maps News Libri Gmail altro

Novità | Guida | Accedi

Google maps Italia

from:STRADA DEI MERCATI 9 PARMA Italia 43100 to:Via Albertelli 12 PARMA Italia 43100

Cerca sulle mappe Mostra opzioni di ricerca

Trova attività commerciali, indirizzi e luoghi di interesse.

Indicazioni stradali Le mie mappe

- A STRADA DEI MERCATI 9 PARMA Italia 43100
- B Via Albertelli 12 PARMA Italia 43100
- C Strada Cavour PARMA Italia 43100
- D VIA IMPERIA 20 PARMA Italia 43100
- E STRADA Mazzini 6/a PARMA Italia 43100
- F STRADA Mazzini PARMA Italia 43100
- G Strada Abbeveratoia, 87, 43126 Parma, Emilia Romagna
- H STRADA DEI MERCATI 9 PARMA Italia 43100

Aggiungi destinazione - Mostra opzioni

Auto

Ottni indicazioni stradali

Alternative disponibili: A piedi

Indicazioni stradali per Strada dei Mercati, 9, 43126 Parma PR

14,7 km – circa 41 min

A Strada dei Mercati, 9 43126 Parma PR

1. Procedi in direzione est da Strada dei Mercati verso Strada Stellini

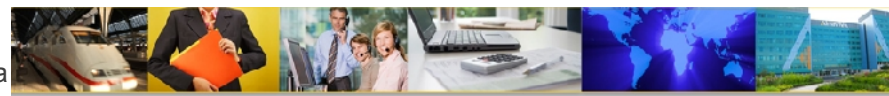
0,2 km

500 m 2000 ft

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Stampa Invia Link

Altro... Mappa Satellite Rilievo



# City Logistics: Personalizzazione OpenERP (Mobile)



MAIN MENU SHORTCUTS

Database: **test** | Search | Filter | Calendar | Gantt | Graphs

New | Edit | Duplicate | Delete | << First | Previous (2/65) | Next | Last >>

Camionino: **Camion** | Progressione: ?  
 Indirizzo: **Strada Cavallar** | Cliente: **Il Corallo**  
 Merca: **B.C. Pella** | Stato: **in consegna**

Filter | Delete | Edit | New

<input type="checkbox"/>	Codice	Nome	Targa	Varianti	UM predefinita
<input type="checkbox"/>	<a href="#">T001</a>	Camion 1	SS666KK		PCE
<input type="checkbox"/>	<a href="#">T002</a>	Camion 2	AB000BA		PCE
<input type="checkbox"/>	<a href="#">T003</a>	Camion 3	HS521PI		PCE
<input type="checkbox"/>	<a href="#">T004</a>	Camion 4	AA034JK		PCE
<input type="checkbox"/>	<a href="#">T005</a>	Camion 5	AC430AC		PCE

## Comunicazione Avvenuta Consegna

## Ricerca Veicolo per Targa

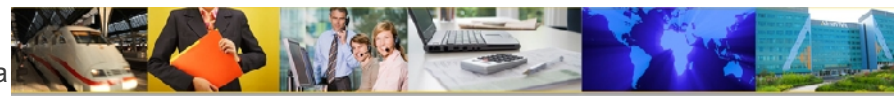
MAIN MENU SHORTCUTS

Barcode

Save | Save & Edit | Cancel

EAN13:

## Automazione Entrata Merci via Lettore Barcode



# Domande?

