

Architektury informatycznych systemów zarządzania W2

dr inż. Janusz Granat

Plan wykładu

- Architektura generyczna
- Odoo
- SAP

Definicja architektury systemu

Architektura systemu to model koncepcyjny, który określa strukturę, zachowanie i pożądane widoki systemu.

Opis architektury to formalny opis i reprezentacja systemu, zorganizowana w sposób, który wspiera rozumowanie dotyczące struktur i zachowań systemu.

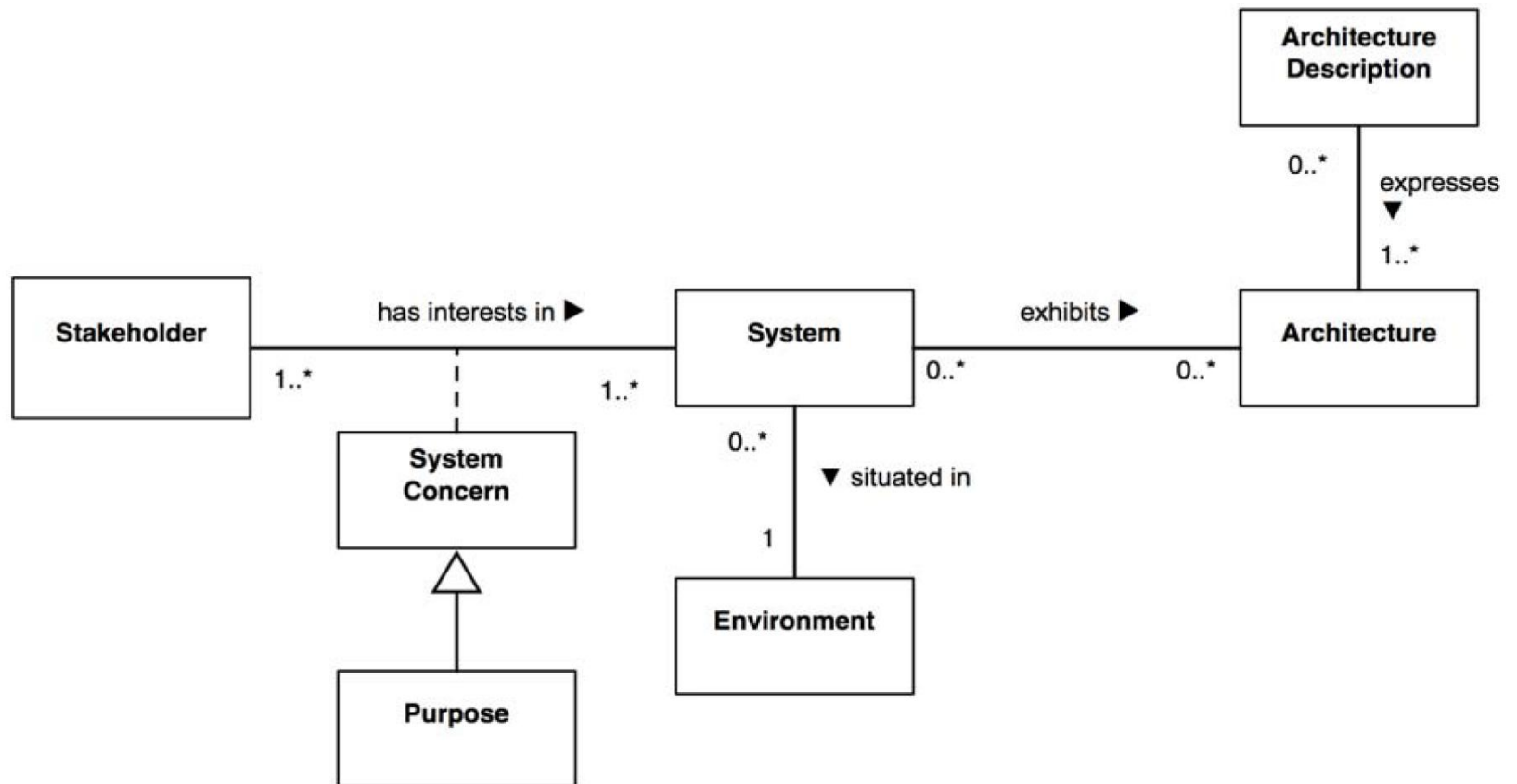
Wikipedia

Różne rodzaje architektur

- Architektura przedsiębiorstwa (biznes)
- Architektura oprogramowania (software)
- Architektura sprzętu (hardware)

ISO/IEC/IEEE 42010 Systems and software engineering — Architecture description

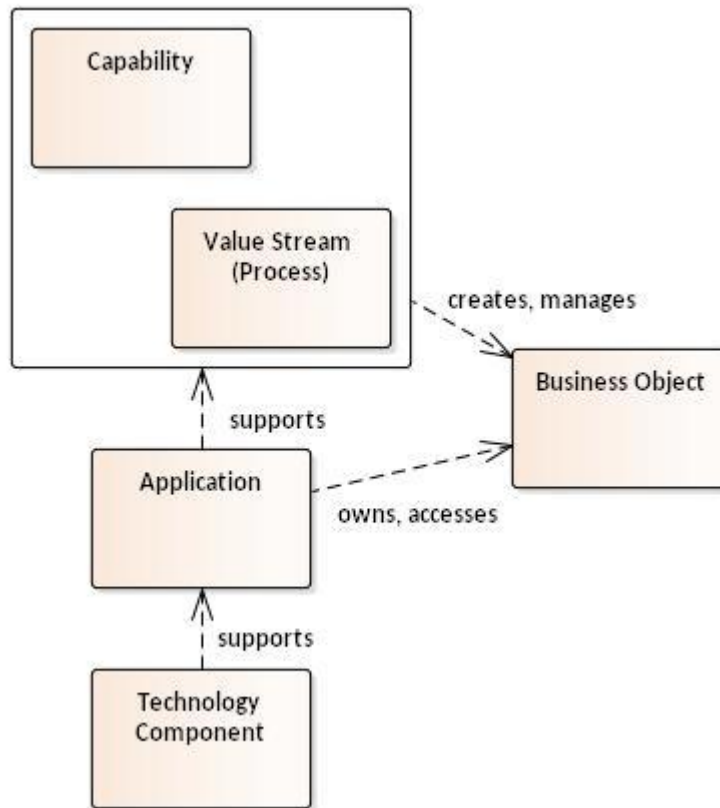
Kontekst architektury



ISO/IEC/IEEE 42010

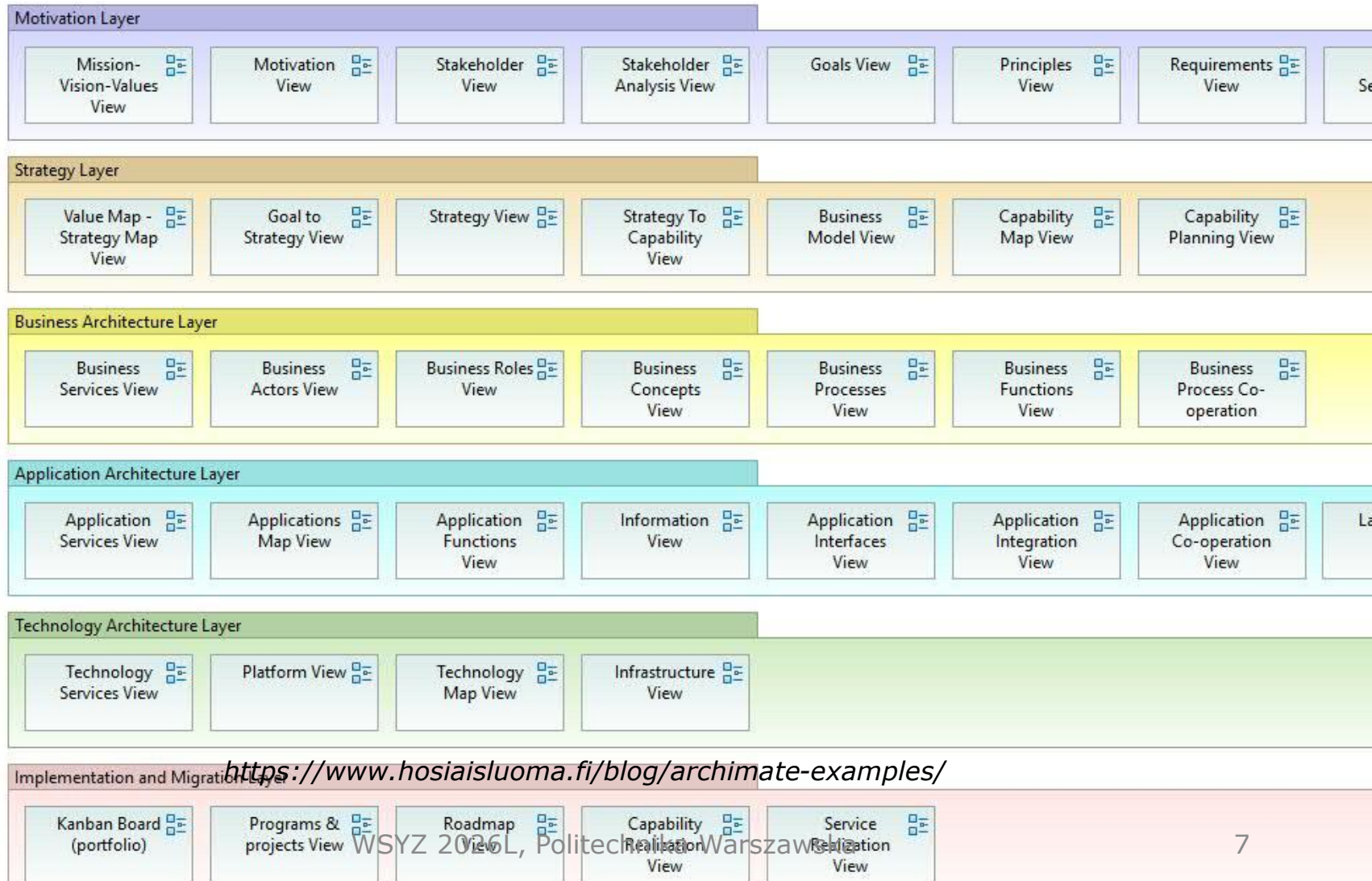
First edition 2011-12-01 Systems and software engineering —Architecture description

Komponenty architektury

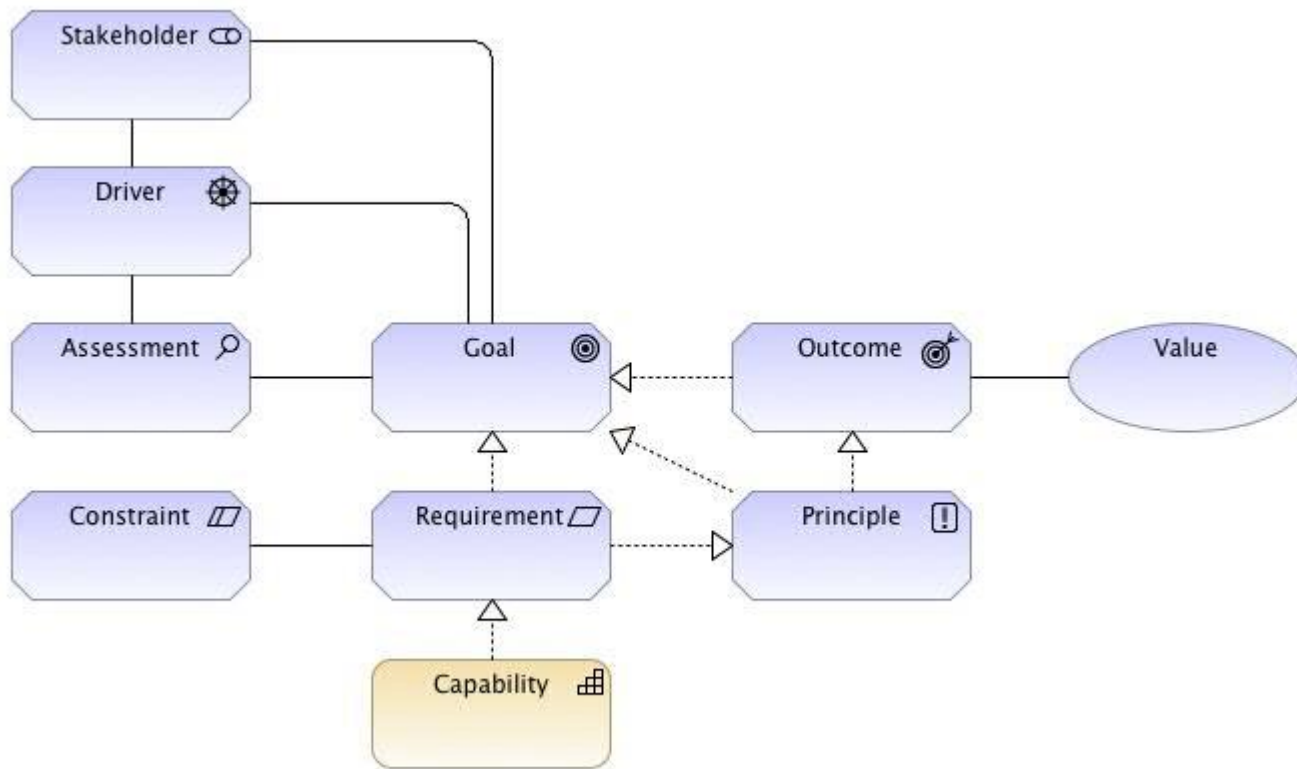


Foundations of the Architectural Thinking Framework®, Dr. Wolfgang Goebel, V1.0 August 9th, 2018
architectural-thinking.com

Modelowanie architektury – ArchiMate

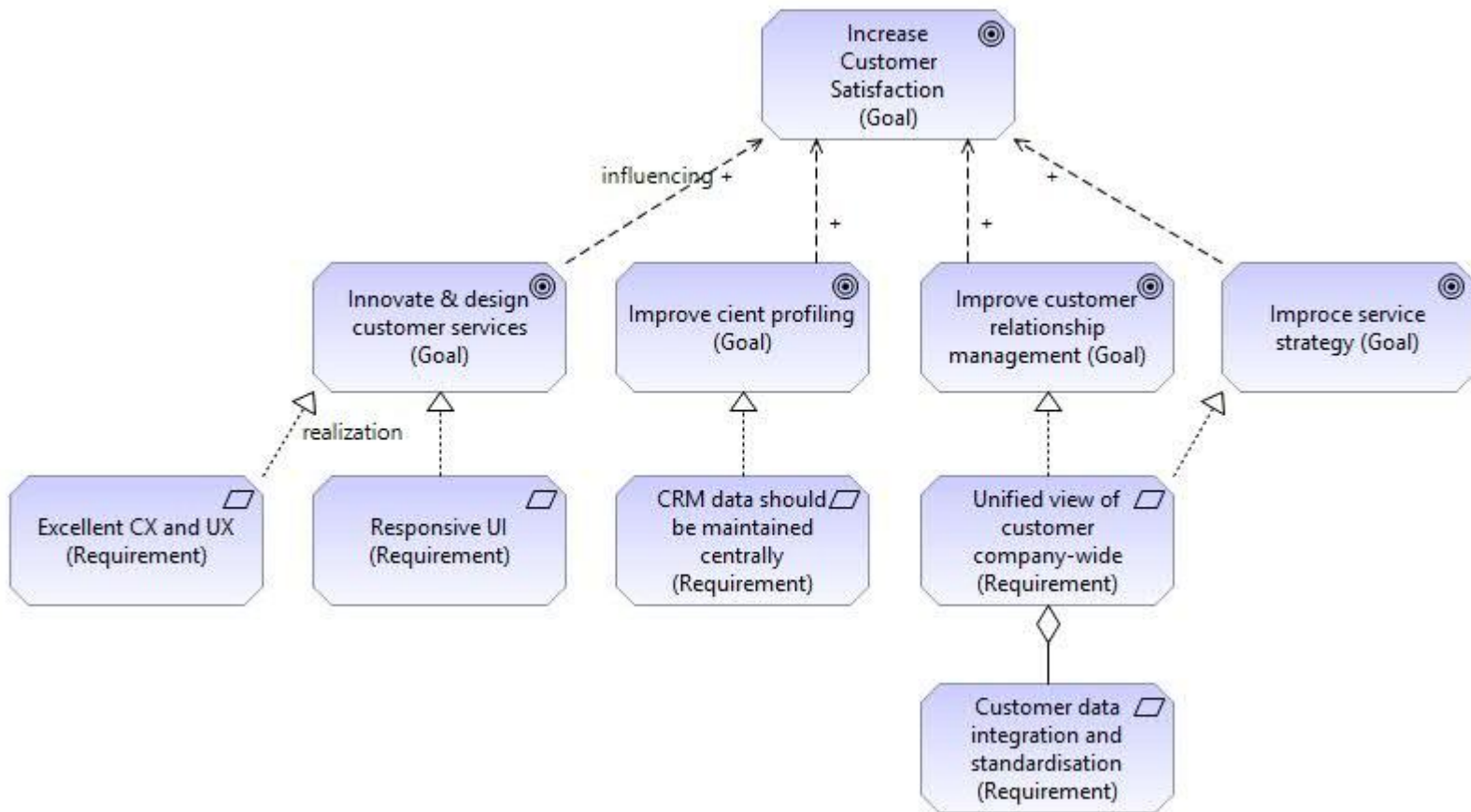


Motywacja biznesowa



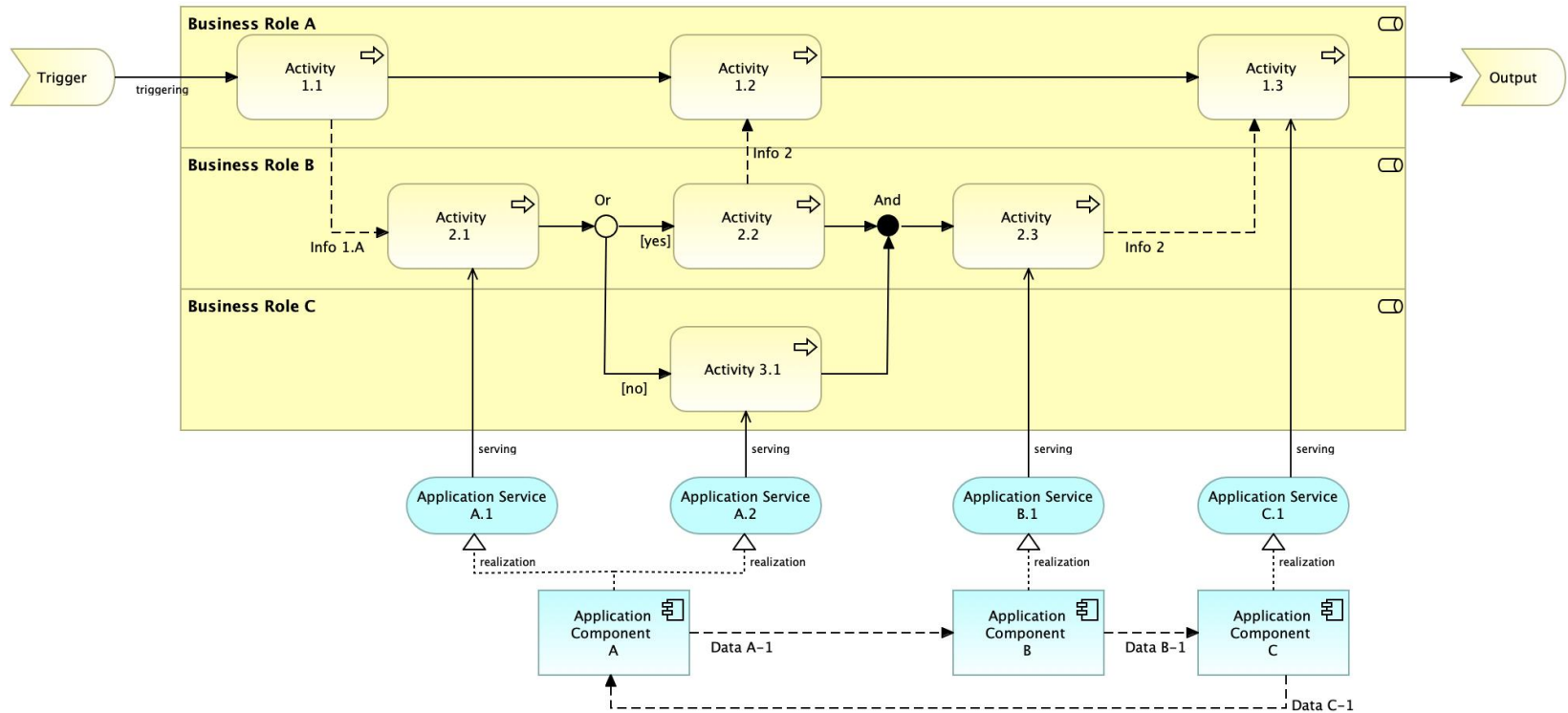
<https://www.hosiaisluomo.fi/blog/archimate-examples/>

Wymagania biznesowe



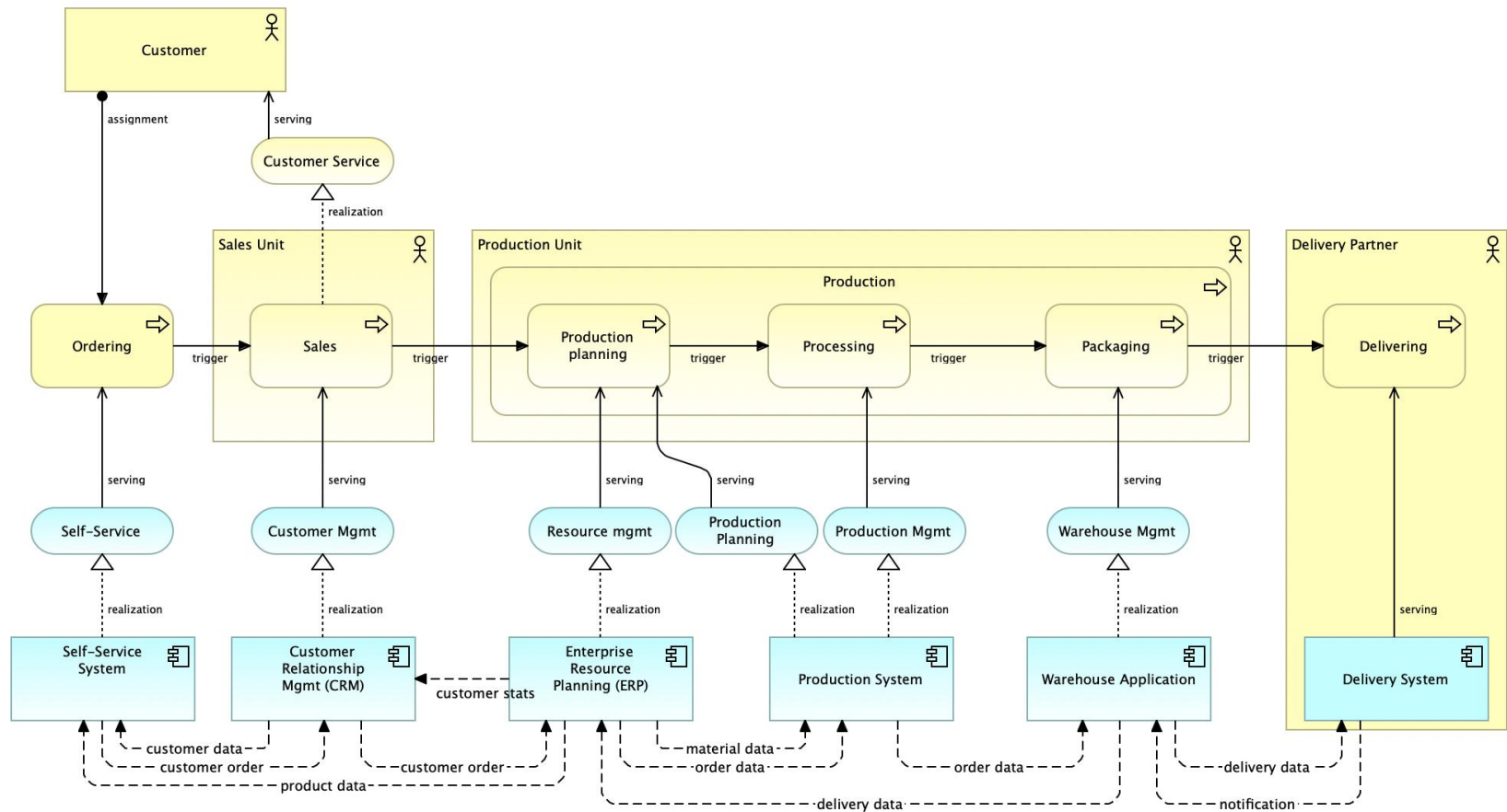
<https://www.hosiaislouma.fi/blog/archimate-examples/>

Procesy biznesowe



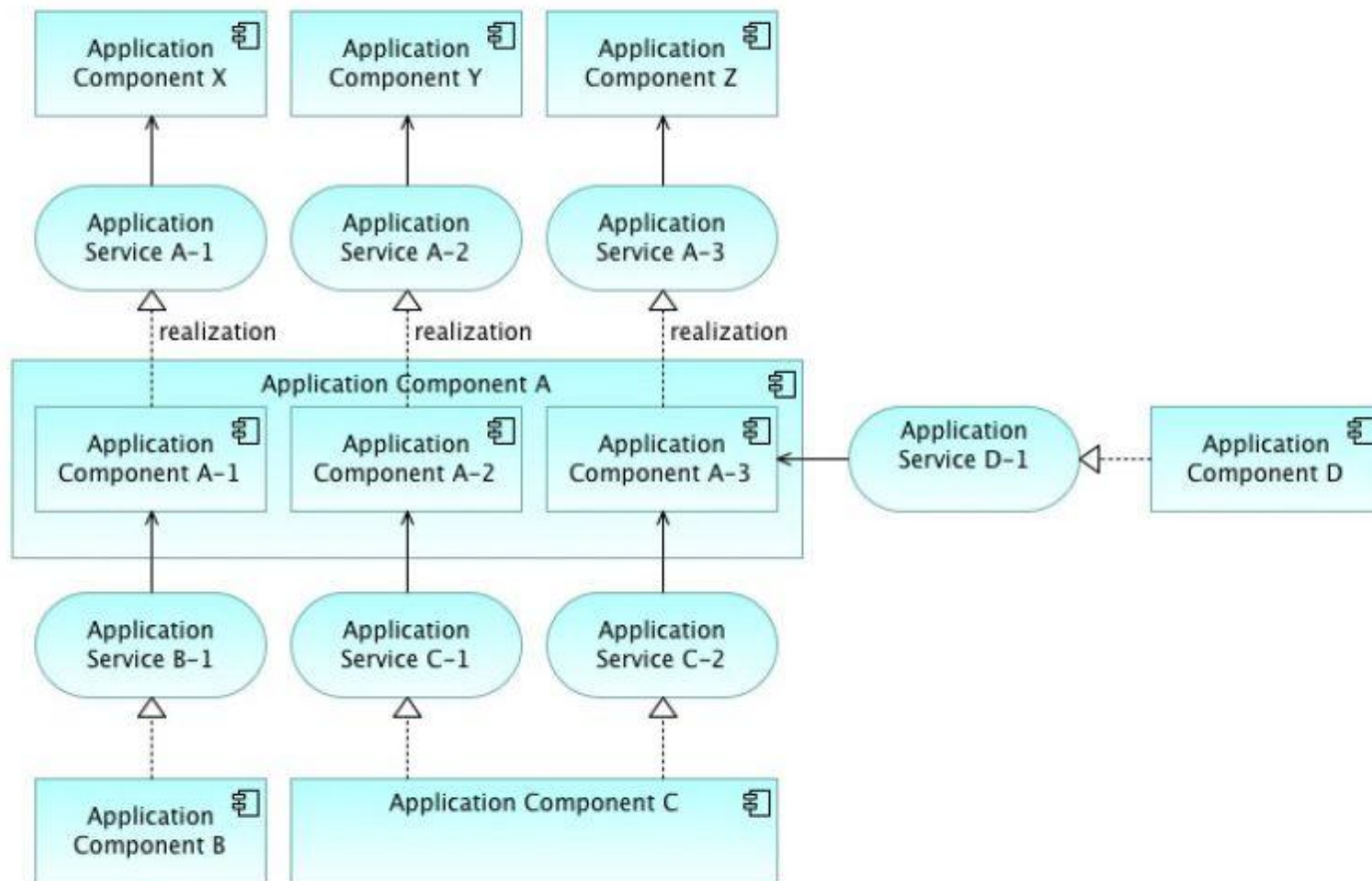
<https://www.hosiaisluomo.fi/blog/archimate-examples/>

Architektura biznesowa

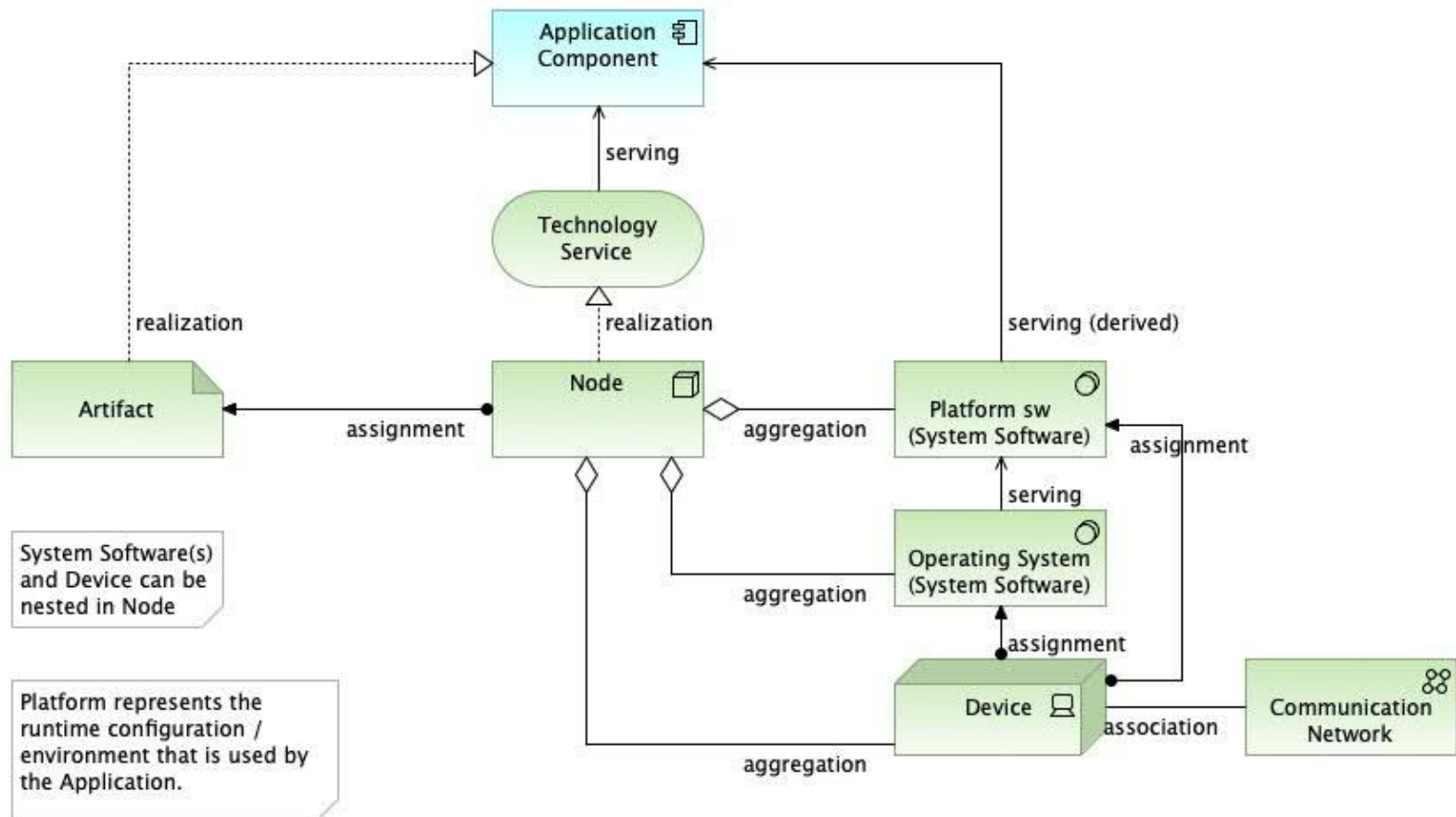


<https://www.hosiaisluomo.fi/blog/archimate-examples/>

Widok aplikacji i usług



Widok infrastruktury

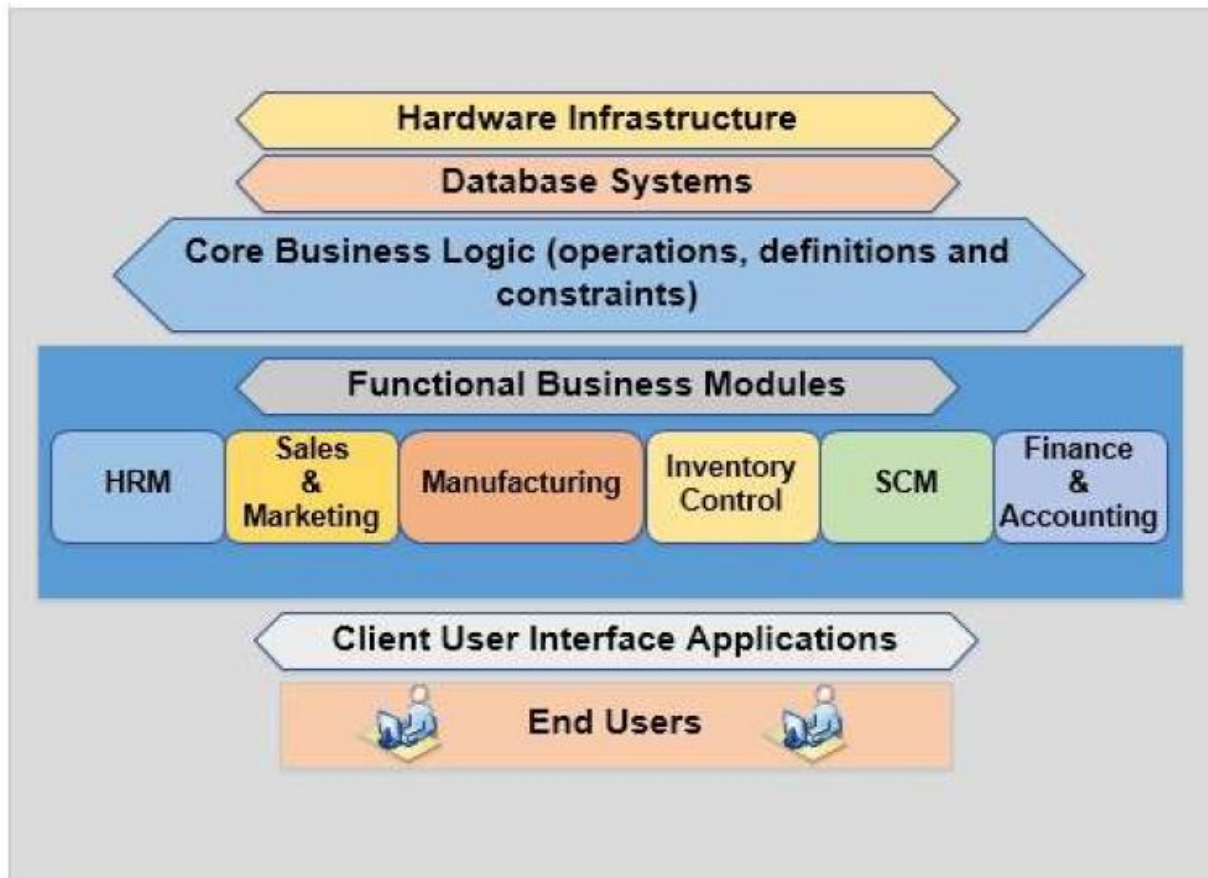


<https://www.hosiaisluomo.fi/blog/archimate-examples/>

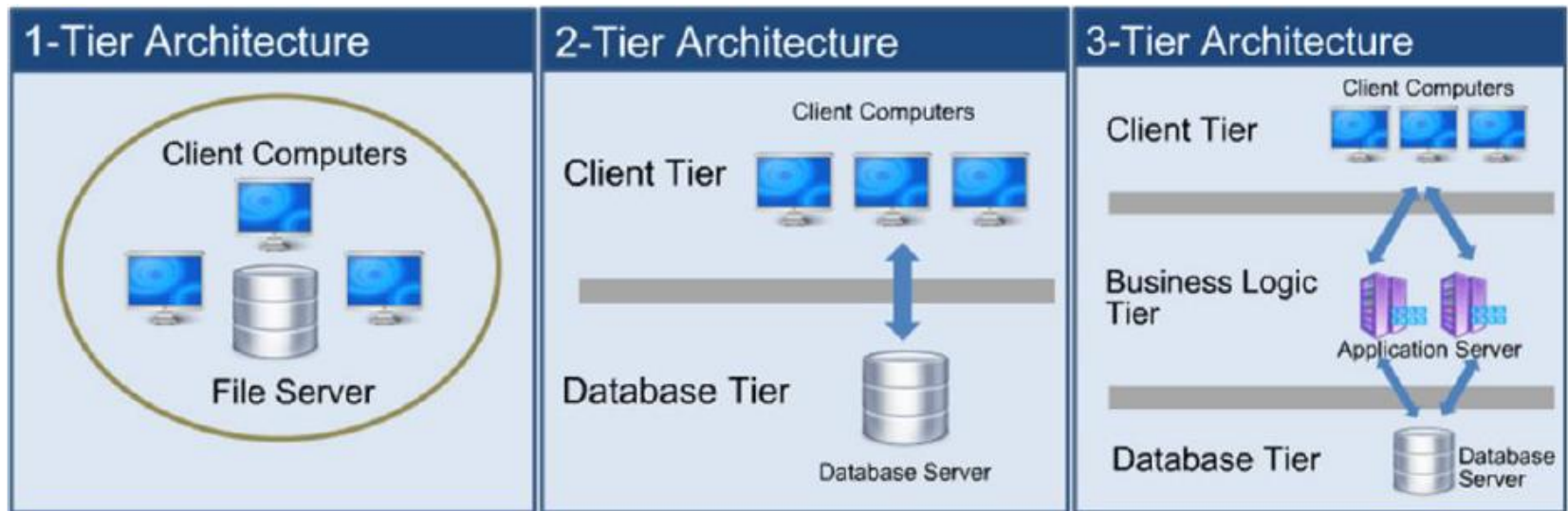
Architektura systemów zarządzania

- Systemy informatyczne zarządzania rządzą się tymi samymi prawami co inne systemy informatyczne
- Różnica polega na tym, że zazwyczaj nie budujemy je od podstaw tylko korzystamy z gotowych komponentów i rozwiązań

Architektura funkcjonalna ERP



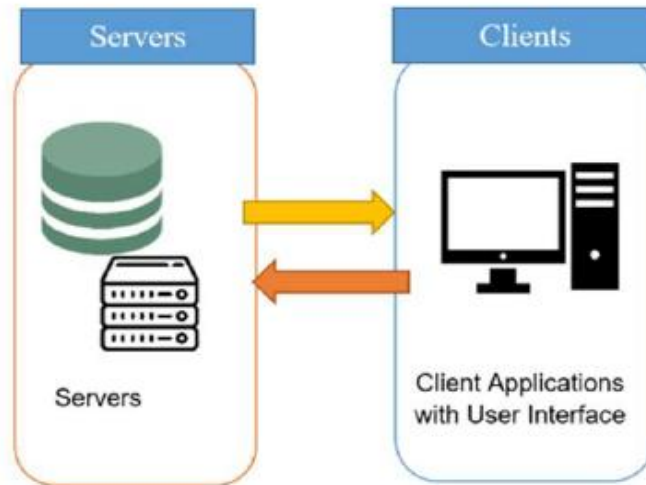
Architektury warstwowe



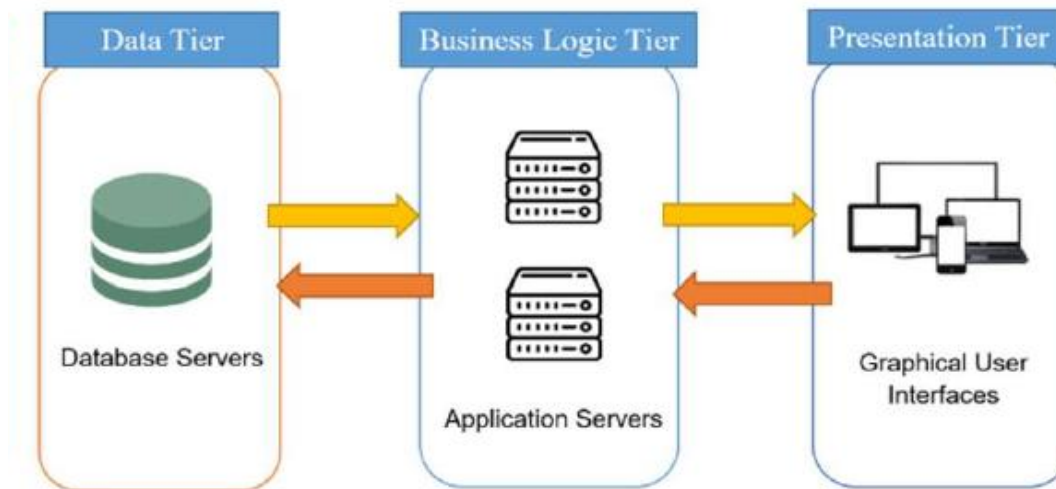
International Journal of Computer Applications (0975 – 8887)

Volume 167 – No.9, June 2017

Architektura fizyczna 2 warstwowa



Architektura fizyczna – 3 warstwowa



Architektura oparta o chmurę

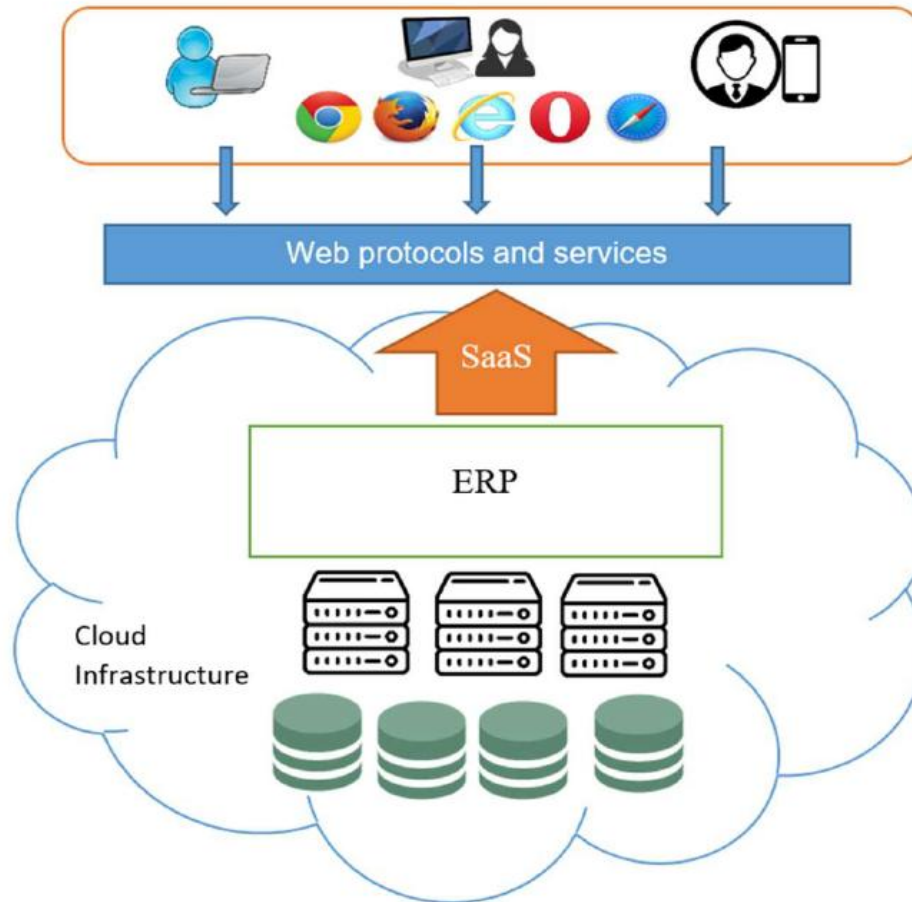


Figure 1. Magic Quadrant for Cloud Core Financial Management Suites for Midsize, Large and Global Enterprises



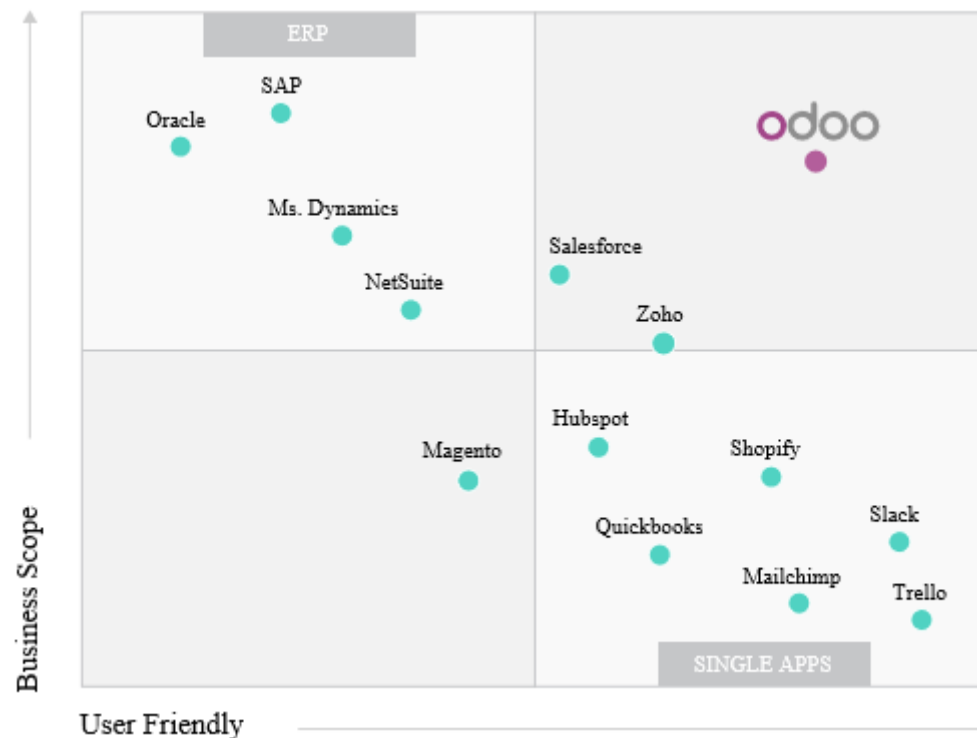
Source: Gartner (May 2019)

Odoo – historia i cechy

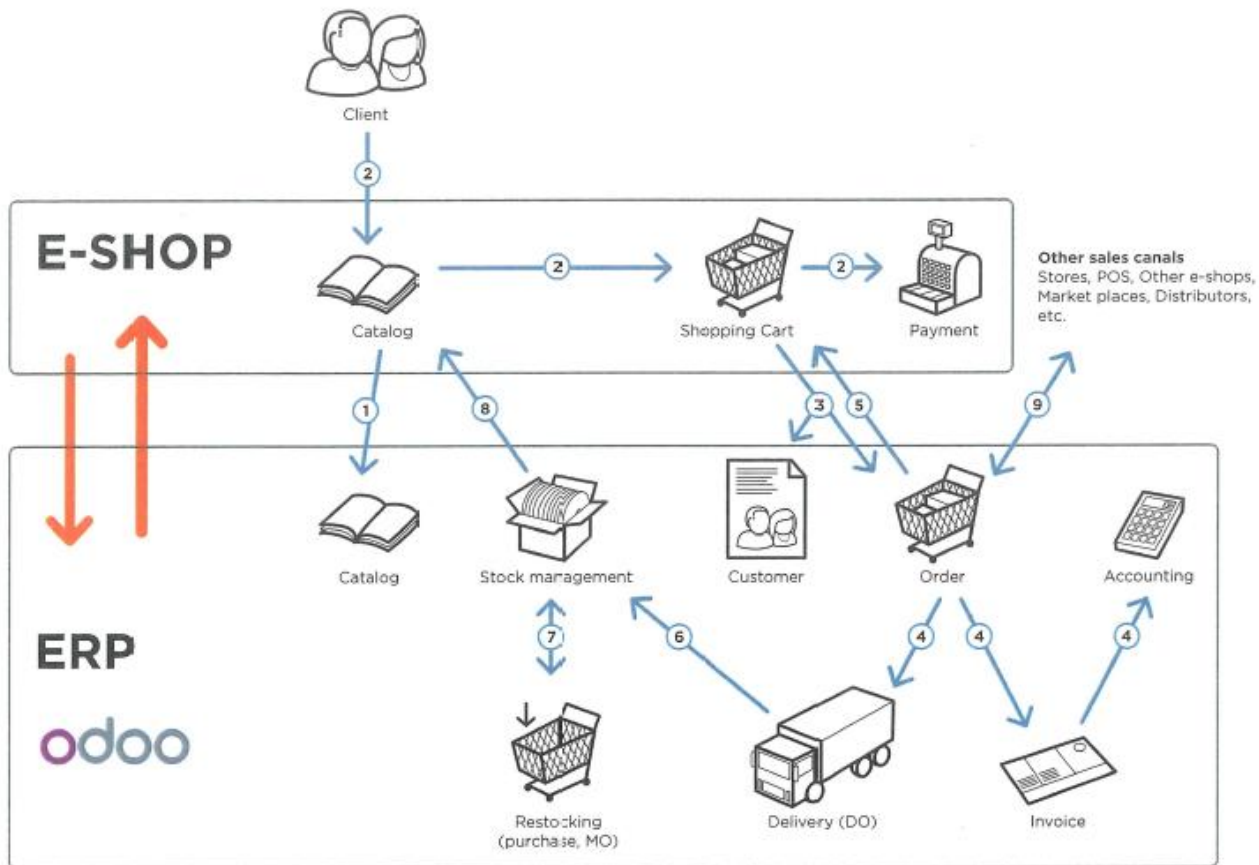
- Opensource ERP
- PostgreSQL
- Python, js, XML
- Modułowa struktura
- Łatwy do rozbudowy

Program name	Version	Release date
Tiny ERP	1.0	February 2005
	2.0	May 2005
	3.0	September 2005
	4.0	December 2006
OpenERP	5.0	April 2009
	6.0	January 2011
	6.1	February 2012
	7.0	December 22, 2012
Odoo	8.0	September 18, 2014
	9.0	October 1, 2015

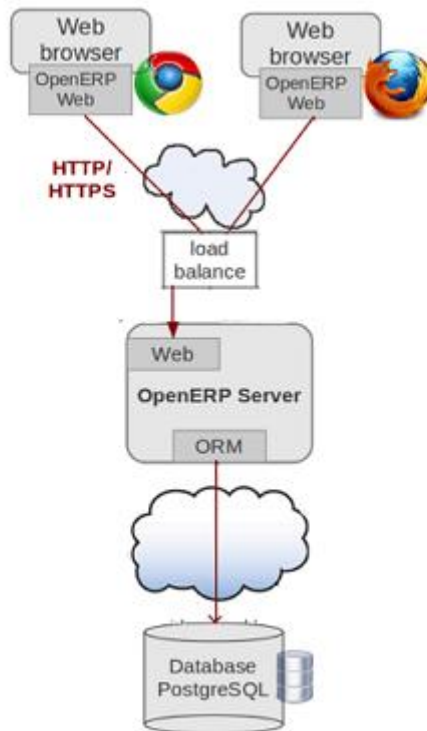
Odoo (user friendly vs business scope)



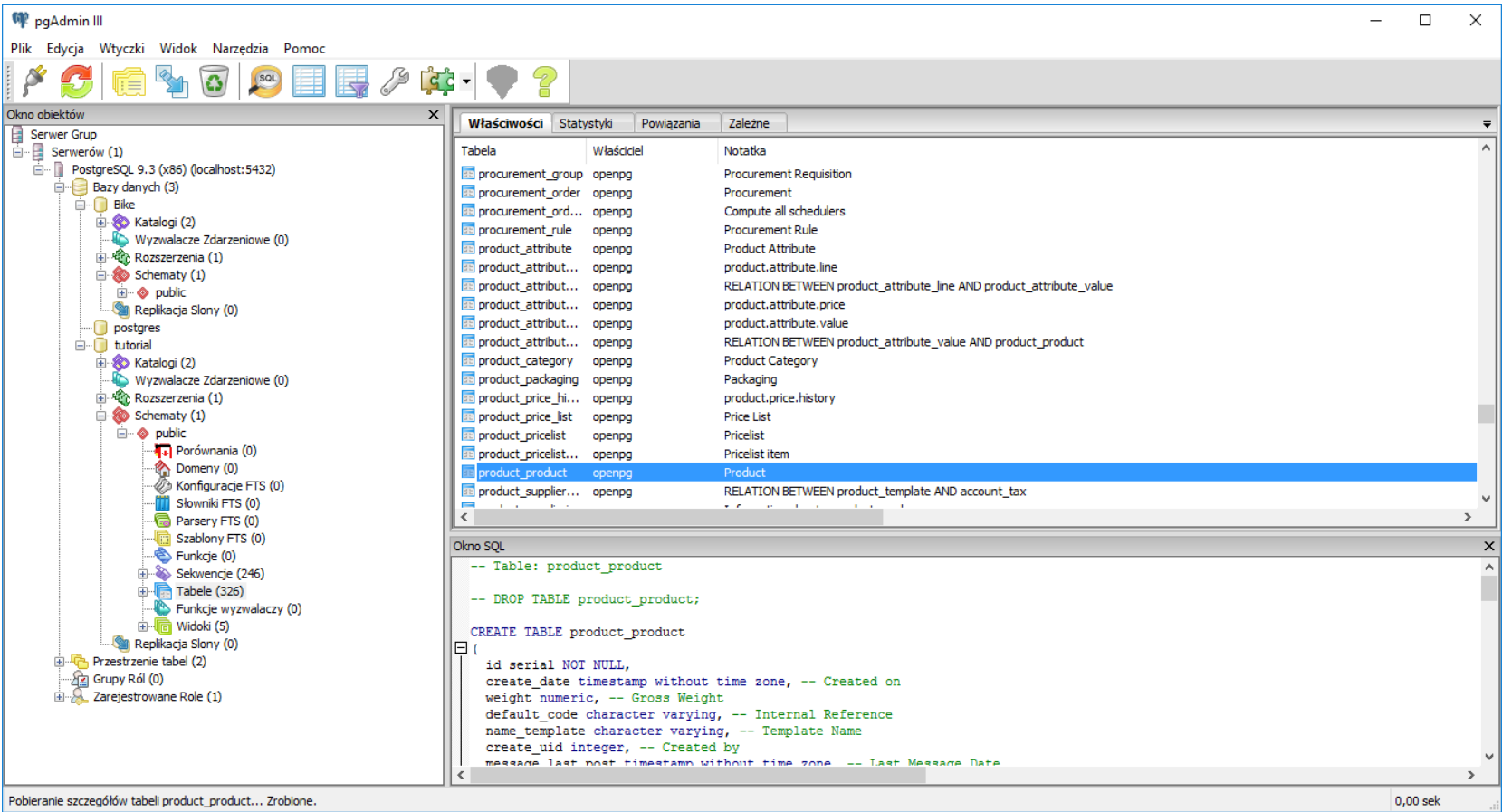
Przykładowe zastosowanie odoo



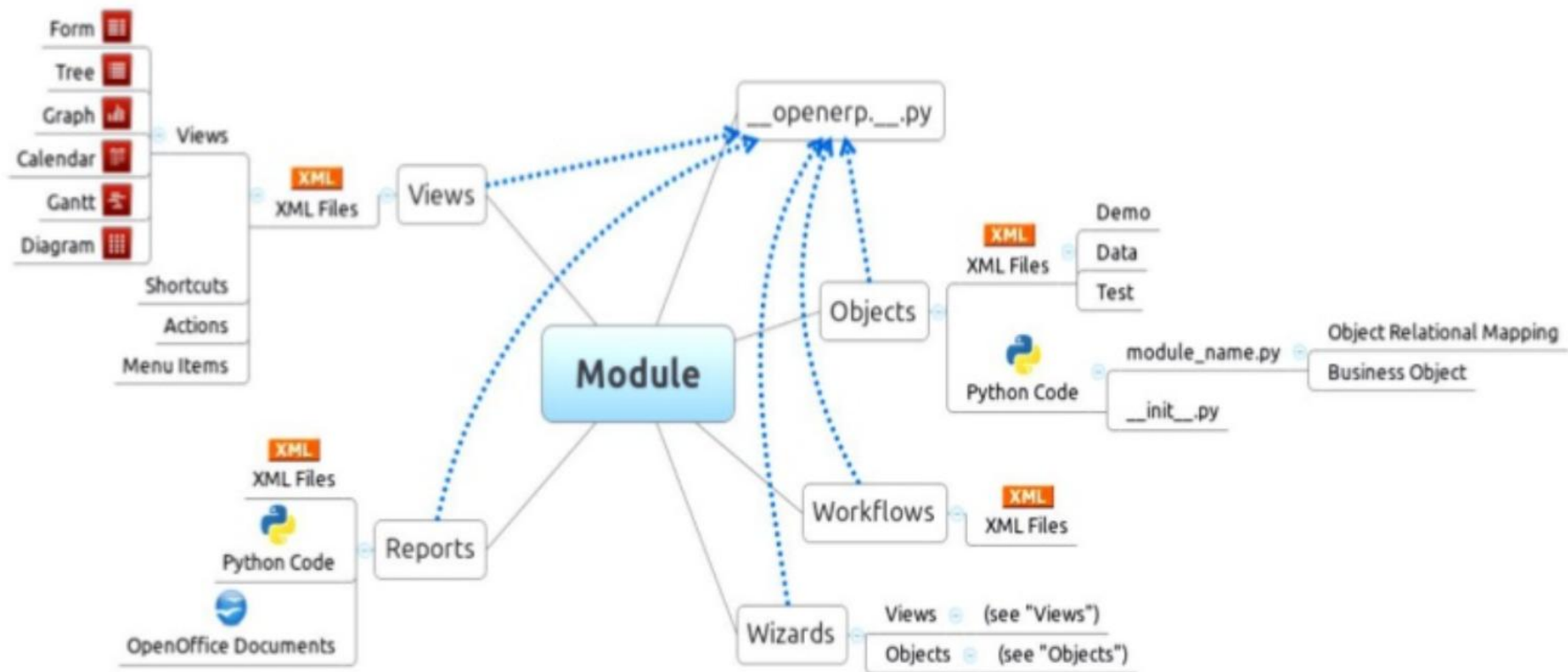
Architektura Odoo



Baza danych



Moduł Odoo

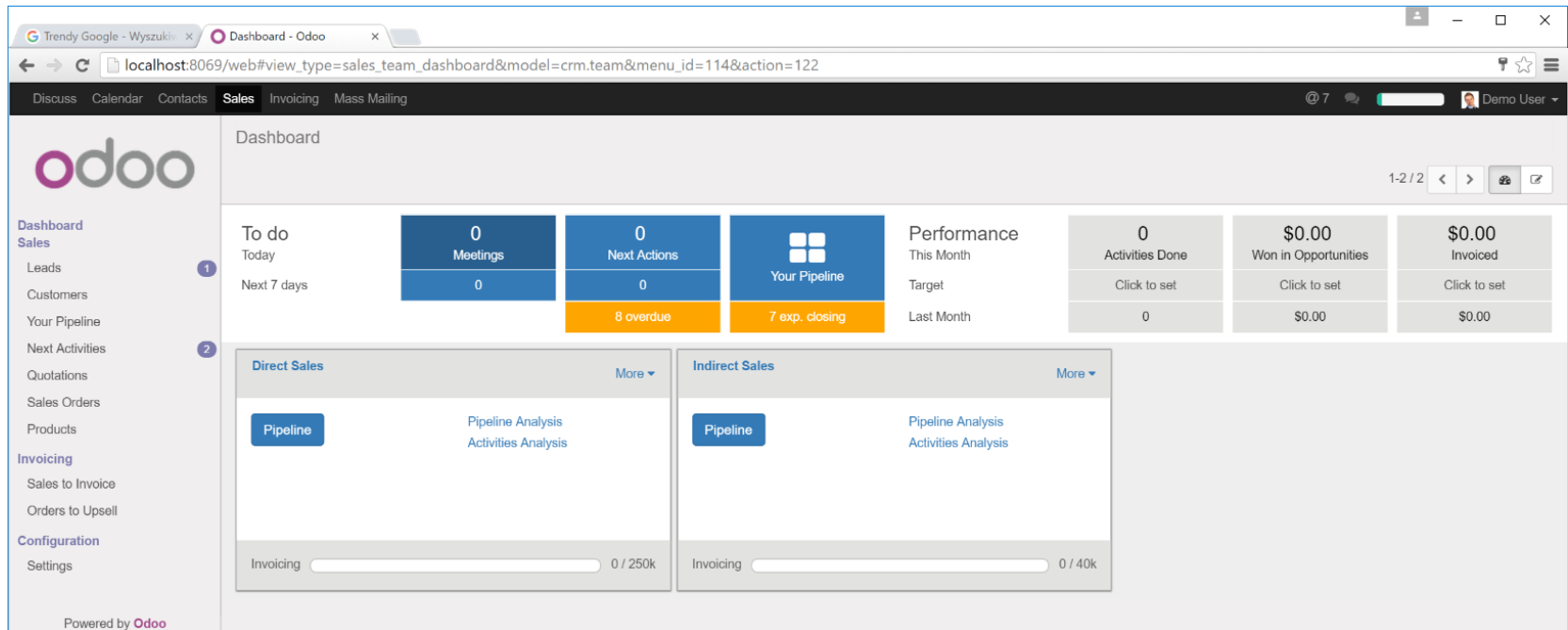


Moduły (App) odoo

The screenshot displays the Odoo web interface, specifically the 'Apps' section. The browser's address bar shows the URL: `localhost:8069/web#view_type=kanban&model=ir.module.module&menu_id=51&action=36`. The top navigation bar includes links for 'Discuss', 'Contacts', 'Sales', 'Invoicing', 'Apps', and 'Settings'. The 'Apps' menu is currently selected. On the left sidebar, the 'odoo' logo is visible, along with a link to 'Apps Updates'. The main content area is titled 'Apps' and features a search bar with the text 'Apps'. Below the search bar, there is a grid of 28 app tiles, each representing a different module. Each tile contains an icon, the app name, a brief description, and an 'Install' button. The apps are arranged in a grid that is 7 rows high and 4 columns wide. The first row contains: CRM, Project Management, Inventory Management, MRP, and Sales Management. The second row contains: Point of Sale, Discuss, Leave Management, Invoicing, and Accounting and Finance. The third row contains: Issue Tracking, Notes, Website Builder, eCommerce, and Purchase Management. The fourth row contains: Employee Directory, Timesheets, Recruitment Process, Expense Tracker, and Dashboards. The fifth row contains: Survey, Mass Mailing Campaigns, Lunch, Equipments, and Calendar. The sixth row contains: Online Events, Blogs, Slides, Forum, and Fleet Management. The seventh row contains: Website Live Chat and Repairs Management. The 'Sales Management' app is marked as 'Installed'. The 'Discuss' app is also marked as 'Installed'. The bottom of the page shows the text 'Powered by Odoo'.

App Name	Description	Status
CRM	Leads, Opportunities, Activities	Install
Project Management	Projects, Tasks	Install
Inventory Management	Inventory, Logistics, Warehousing	Install
MRP	Manufacturing Orders, Bill of Materials, Routings	Install
Sales Management	Quotations, Sales Orders, Invoicing	Installed
Point of Sale	Touchscreen Interface for Shops	Install
Discuss	Discussions, Mailing Lists, News	Installed
Leave Management	Holidays, Allocation and Leave Requests	Install
Invoicing	Send Invoices and Track Payments	Installed
Accounting and Finance	Financial and Analytic Accounting	Install
Issue Tracking	Support, Bug Tracker, Helpdesk	Install
Notes	Sticky notes, Collaborative, Memos	Install
Website Builder	Build Your Enterprise Website	Install
eCommerce	Sell Your Products Online	Install
Purchase Management	Purchase Orders, Receipts, Vendor Bills	Install
Employee Directory	Jobs, Departments, Employees Details	Install
Timesheets	Timesheets, Attendances, Activities	Install
Recruitment Process	Jobs, Recruitment, Applications, Job Interviews, Surveys	Install
Expense Tracker	Expenses Validation, Invoicing	Install
Dashboards	Create your custom dashboard	Install
Survey	Create surveys, collect answers and print statistics	Install
Mass Mailing Campaigns	Design, send and track emails	Install
Lunch	Lunch Order, Meal, Food	Install
Equipments	Equipments, Assets, Internal Hardware, Allocation Tracking	Install
Calendar	Personal & Shared Calendar	Install
Online Events	Schedule, Promote and Sell Events	Install
Blogs	News, Blogs, Announces, Discussions	Install
Slides	Share and Publish Videos, Presentations and Documents	Install
Forum	Forum, FAQ, Q&A	Install
Fleet Management	Vehicle, leasing, insurances, costs	Install
Website Live Chat	Website Live Chat with Visitors/Customers	Install
Repairs Management	Repair broken or damaged products	Install

Sales dashboard



Klienci

The screenshot shows the Odoo web interface in a browser window. The address bar indicates the URL is `localhost:8069/web#view_type=kanban&model=res.partner&menu_id=68&action=54`. The browser tabs include 'Trendy Google - Wyszuki...' and 'Customers - Odoo'. The top navigation bar contains links for 'Discuss', 'Calendar', 'Contacts', 'Sales', 'Invoicing', and 'Mass Mailing'. The 'Sales' menu is active, and the user is identified as 'Demo User'.

The main content area is titled 'Customers' and features a search bar with the text 'Customers x'. Below the search bar, there are five customer cards displayed in a grid:

- Agrolait**: Wavre, Belgium. Email: `agrolait@yourcompany.example.com`. Rating: 3 stars, 2 orders.
- Camp to camp**: Le Bourget du Lac, France. Email: `camptocamp@yourcompany.example.com`. Rating: 2 orders.
- China Export**: Shanghai, China. Email: `chinaexport@yourcompany.example.com`. Rating: 1 order, 1 sale.
- The Jackson Group**: Miami, United States. Email: `jackson@yourcompany.example.com`.
- Think Big Systems**: London, United Kingdom. Email: `thinkbig@yourcompany.example.com`.

A 'Demo Portal User' card is also visible, representing 'Vivegnis, Belgium' with email `demo.portal@yourcompany.example.com`. The left sidebar contains a navigation menu with sections: 'Dashboard', 'Sales' (with sub-items: Leads, Customers, Your Pipeline, Next Activities, Quotations, Sales Orders, Products), 'Invoicing' (with sub-items: Sales to Invoice, Orders to Upsell), and 'Configuration' (with sub-items: Settings). The status bar at the bottom shows `localhost:8069/web#menu_id=68&action=54`.

Czynności

The screenshot displays the Odoo CRM interface, specifically the 'Your Pipeline' view. The browser address bar shows the URL: `localhost:8069/web#view_type=kanban&model=crm.lead&menu_id=201&action=277`. The top navigation bar includes links for Discuss, Calendar, Contacts, Sales, Invoicing, and Mass Mailing. The left sidebar contains a menu with options like Dashboard, Sales, Leads, Customers, Your Pipeline (selected), Next Activities, Quotations, Sales Orders, Products, Invoicing, and Configuration. The main area shows a Kanban board with stages: New, Qualification, Proposition, and Negotiation. Two leads are visible in the Qualification stage:

- Lead 1:** Need a new design for my website. Value: \$3,800.00 - Delta PO. Date: 03/22/2016. Task. Rating: 3 stars.
- Lead 2:** Plan to buy RedHat servers. Value: \$25,000.00 - Agrolait. Date: 03/21/2016. Call. Rating: 3 stars.

The right side of the board shows a vertical bar with the text 'WON (2)'.

Lista aktywności

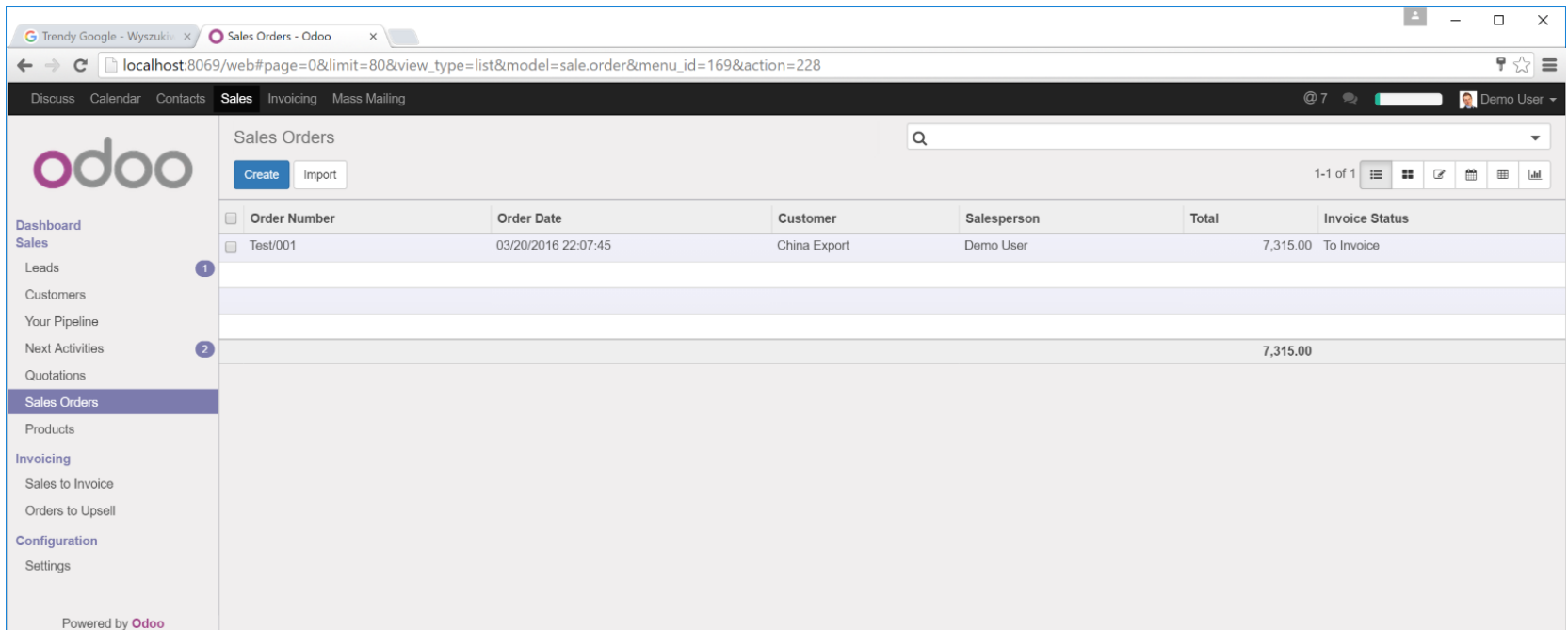
Next Activities

Create Import

1-9 of 9

☐ Opportunity	Partner	Next Activity Date	Next Activity	Next Activity Summary	Stage	Expected Revenue	Expected Closing
☐ Pricing Information of Services		03/19/2016	Email	Send our service pricelist	Qualification	1,000.00	03/23/2016
☐ Interest in your products	Agrolait	03/20/2016	Email	Send Catalog by Email	Won	2,000.00	03/26/2016
☐ Would appreciate more information about your products	Agrolait	03/20/2016	Email	Send Catalog by Email	Negotiation	11,000.00	03/26/2016
☐ Want to subscribe to your online solution	Think Big Systems	03/21/2016	Email		Won	2,000.00	
☐ Plan to buy RedHat servers	Agrolait	03/21/2016	Call	Call to get system requirements	Qualification	25,000.00	03/27/2016
☐ Trainee's training plan in your Organization	Delta PC	03/21/2016	Call	Call to get training needs	Qualification	35,000.00	04/10/2016
☐ Need a new design for my website	Delta PC	03/22/2016	Task	Convert to quote	Qualification	3,800.00	03/27/2016
☐ Interest in your Graphic Design Project	Agrolait	03/23/2016	Email	Send Catalog by Email	New	24,000.00	04/03/2016
☐ Interest in your Partnership Contract	China Export		Call		Won	19,800.00	

Zamówienia do hurtowni



The screenshot displays the Odoo Sales Orders management interface. The browser's address bar shows the URL: `localhost:8069/web#page=0&limit=80&view_type=list&model=sale.order&menu_id=169&action=228`. The top navigation bar includes links for Discuss, Calendar, Contacts, Sales, Invoicing, and Mass Mailing. The left sidebar contains a menu with options: Dashboard, Sales, Leads, Customers, Your Pipeline, Next Activities, Quotations, Sales Orders (highlighted), Products, Invoicing, Sales to Invoice, Orders to Upsell, Configuration, and Settings. The main content area is titled "Sales Orders" and features a search bar, "Create" and "Import" buttons, and a view selector. A table lists the sales orders with columns for Order Number, Order Date, Customer, Salesperson, Total, and Invoice Status. The table contains one entry: "Test/001" with an order date of "03/20/2016 22:07:45", customer "China Export", salesperson "Demo User", and a total of "7,315.00". The invoice status is "To Invoice". A summary row at the bottom shows a total of "7,315.00". The footer indicates "Powered by Odoo".

Order Number	Order Date	Customer	Salesperson	Total	Invoice Status
Test/001	03/20/2016 22:07:45	China Export	Demo User	7,315.00	To Invoice
				7,315.00	

Produkty

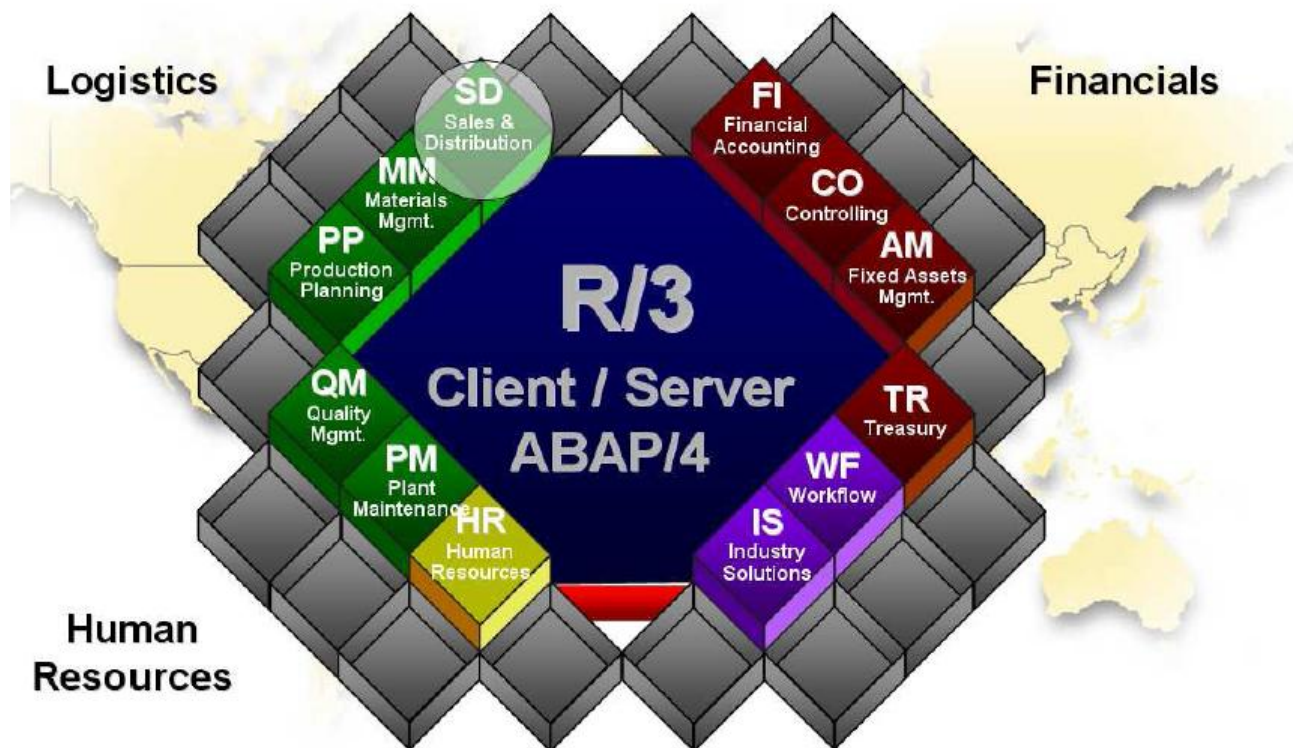
The screenshot displays the Odoo web interface for the 'Products' module. The browser address bar shows the URL: `localhost:8069/web#view_type=kanban&model=product.template&menu_id=102&action=111`. The top navigation bar includes links for Discuss, Calendar, Contacts, Sales, Invoicing, and Mass Mailing. The left sidebar contains a menu with options: Dashboard, Sales, Leads, Customers, Your Pipeline, Next Activities, Quotations, Sales Orders, Products (highlighted), Invoicing, Sales to Invoice, Orders to Upsell, Configuration, and Settings. The main content area is titled 'Products' and features a search bar with the text 'Can be Sold x'. Below the search bar, a grid of 16 product cards is displayed, each showing a product icon, ID, name, and price.

Product ID	Product Name	Price
[RJ45]	30m RJ45 wire	\$250.00
[SIW162]	8-port Switch	\$600.00
[A8767]	Apple In-Ear Headphones	\$79.00
[AK789]	Apple Wireless Keyboard	\$47.00
[BASICCOMP]	Basic Computer	\$23,500.00
[CD]	Blank CD	\$20.00
[DVD]	Blank DVD-RW	\$24.00
[B3423]	Bose Mini Bluetooth Speaker	\$247.00
[C-Case]	Computer Case	\$25.00
[PCSC234]	Computer SC234	\$450.00
[B3424]	Custom Computer (kit)	\$147.00
[DC]	Datacard	\$40.00
[DELL15]	Dell Inspiron Laptop without OS	\$44,000.00
	Deposit	\$150.00
[DSKTAB96]	Desktop Computer Table	\$1,800.00
[DSKLM12]	Desktop Lamp	\$180.00
[ERMO85]	Ergonomic Mouse	\$300.00
	External Audit	\$180.00
[EXT-HDD]	External Hard disk	\$405.00
	GAP Analysis Service	\$30.75

Grupy modułów SAP

- **SAP ERP Financials** – moduł finansów obejmujący zarządzanie kontami oraz rachunkowość, zarządzanie finansami, zarządzanie finansami w łańcuchu dostaw,
- **SAP ERP Human Capital Management** – moduł zarządzania zasobami ludzkimi, integrujący wszystkie najważniejsze aspekty zarządzania kadrami, w tym procesy związane z alokacją zasobów ludzkich, procesami zarządczymi związanymi z zasobami ludzkimi, zarządzaniem talentami,
- **SAP ERP Operations** – moduł działalności operacyjnej obejmujący działania związane z zaopatrzeniem i logistyką, rozwojem produktów i wytwarzaniem, sprzedażą i dystrybucją,
- **SAP ERP Corporate Services** – moduł obsługi organizacyjnej przedsiębiorstwa, w tym zarządzanie majątkiem trwałym, zarządzanie aktywami, zarządzanie portfolio projektów, zarządzaniem wyjazdami służbowymi, aplikacje związane ze środowiskiem, zdrowiem, bezpieczeństwem oraz jakością.

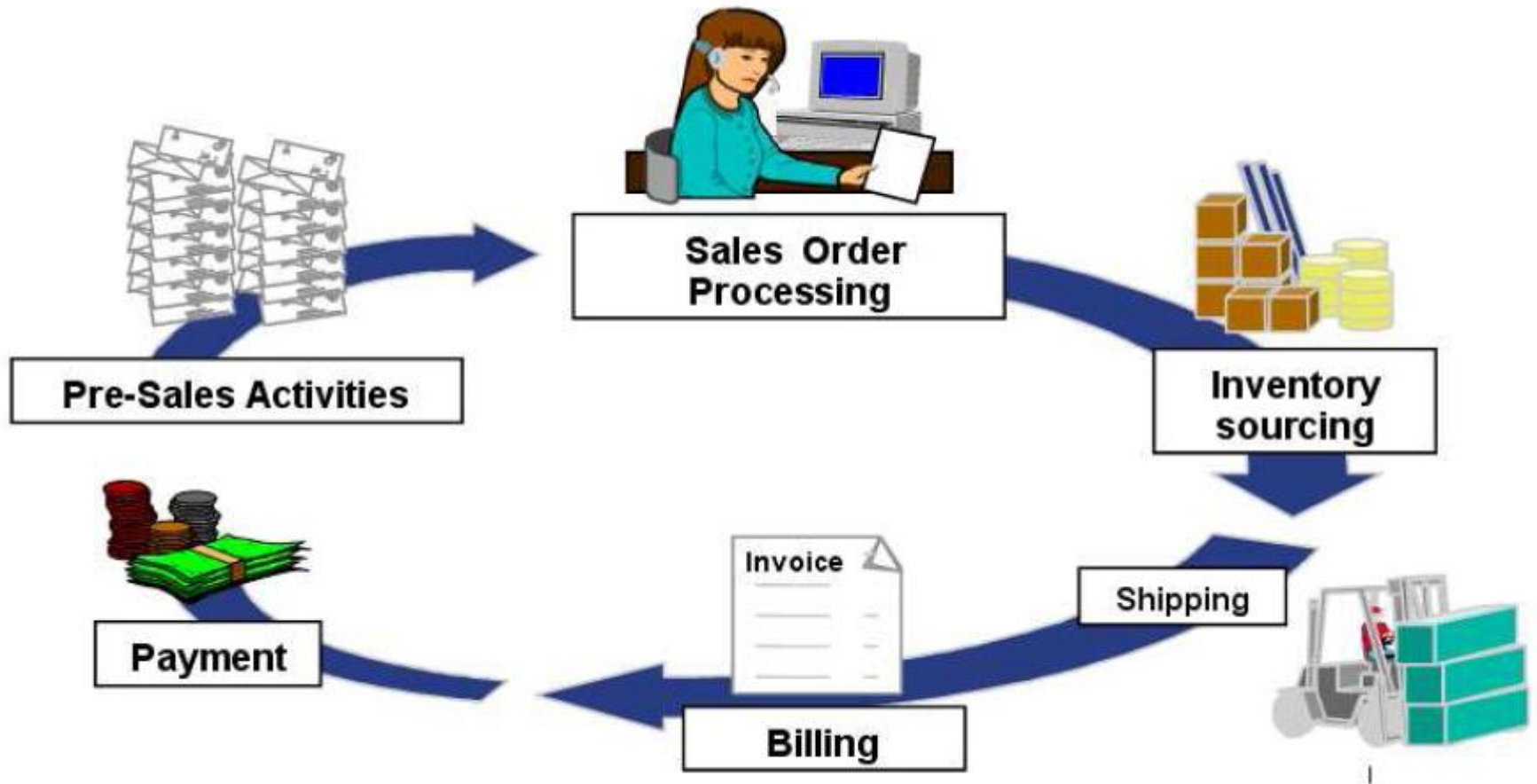
Moduły SAP



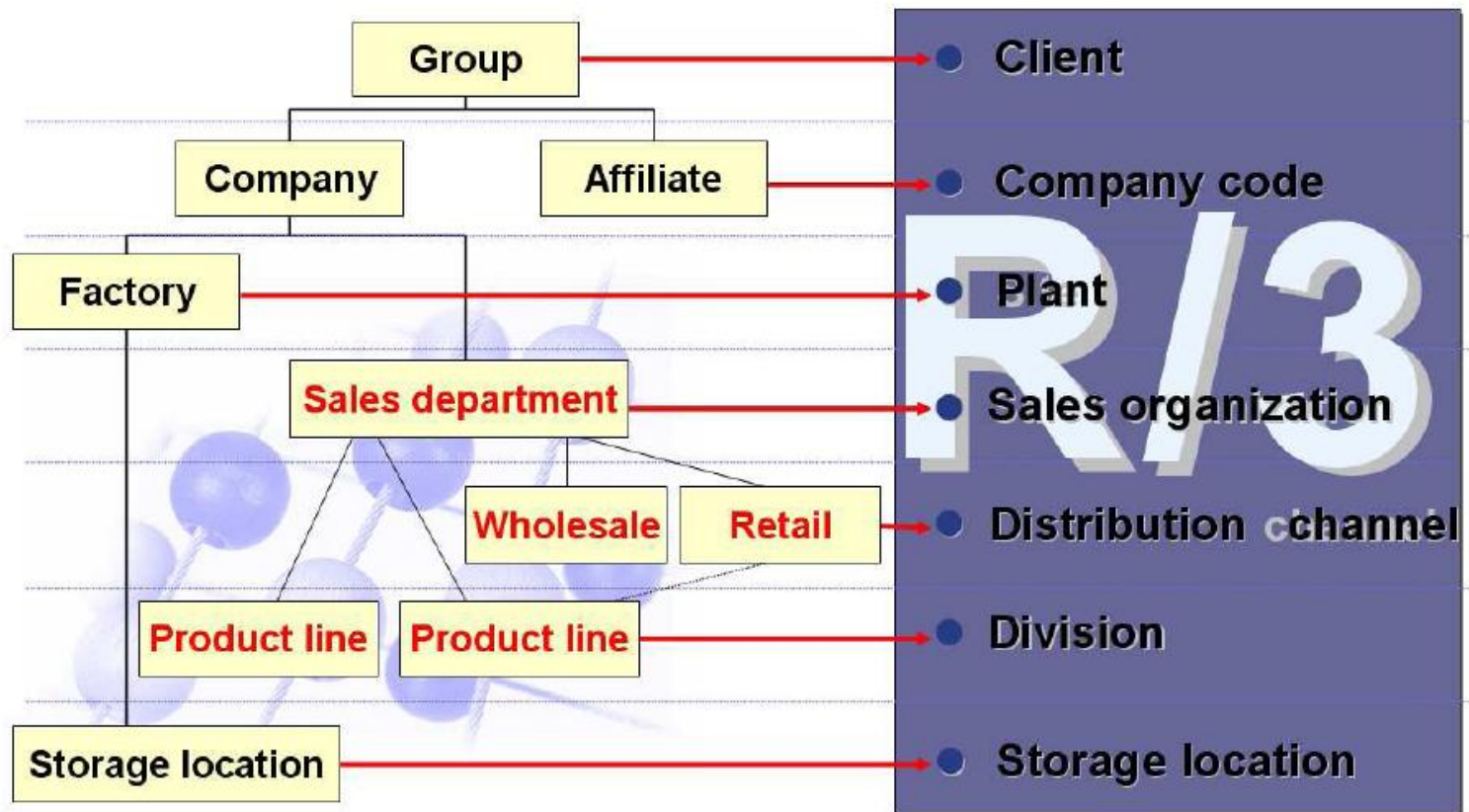
Moduły SAP ECC (ERP Central Component).

- PP (Production Planning) – Planowanie produkcji
- MM (Materials Management) – Gospodarka Materiałowa
- WM (Warehouse Management) – Gospodarka Magazynowa
- SD (Sales and Distribution) – Sprzedaż i dystrybucja
- FI (Financial Accounting) - Finanse
- CO (Controlling) – Kontroling finansowy
- AM (Fixed Assets Management) – Zarządzanie środkami trwałymi
- PS (Project System) – System projektowy
- WF (Workflow) - Workflow
- HR (Human Resources) – Zarządzanie zasobami ludzkimi
- PM (Plant Maintenance) – Utrzymanie zakładu
- QM (Quality Management) – Zarządzanie jakością
- IS (Industry Solutions) – Rozwiązania branżowe

Proces sprzedaży

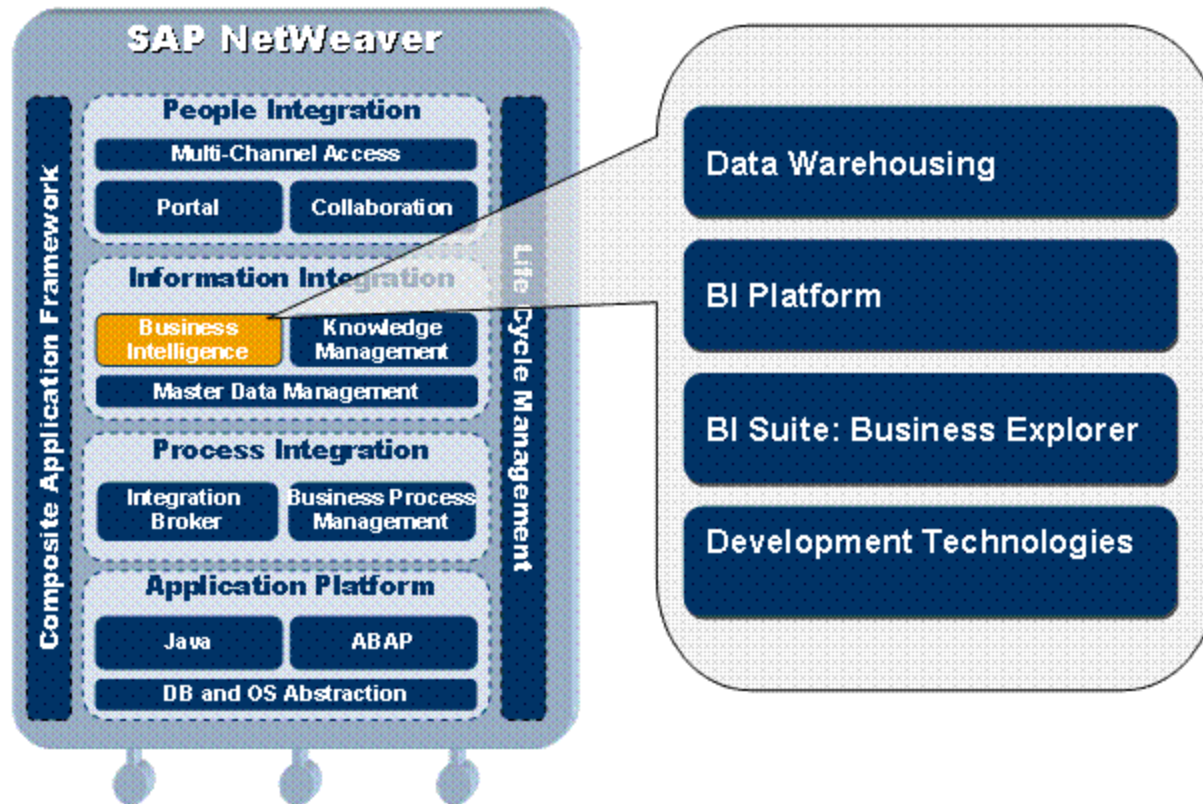


Struktura organizacyjna

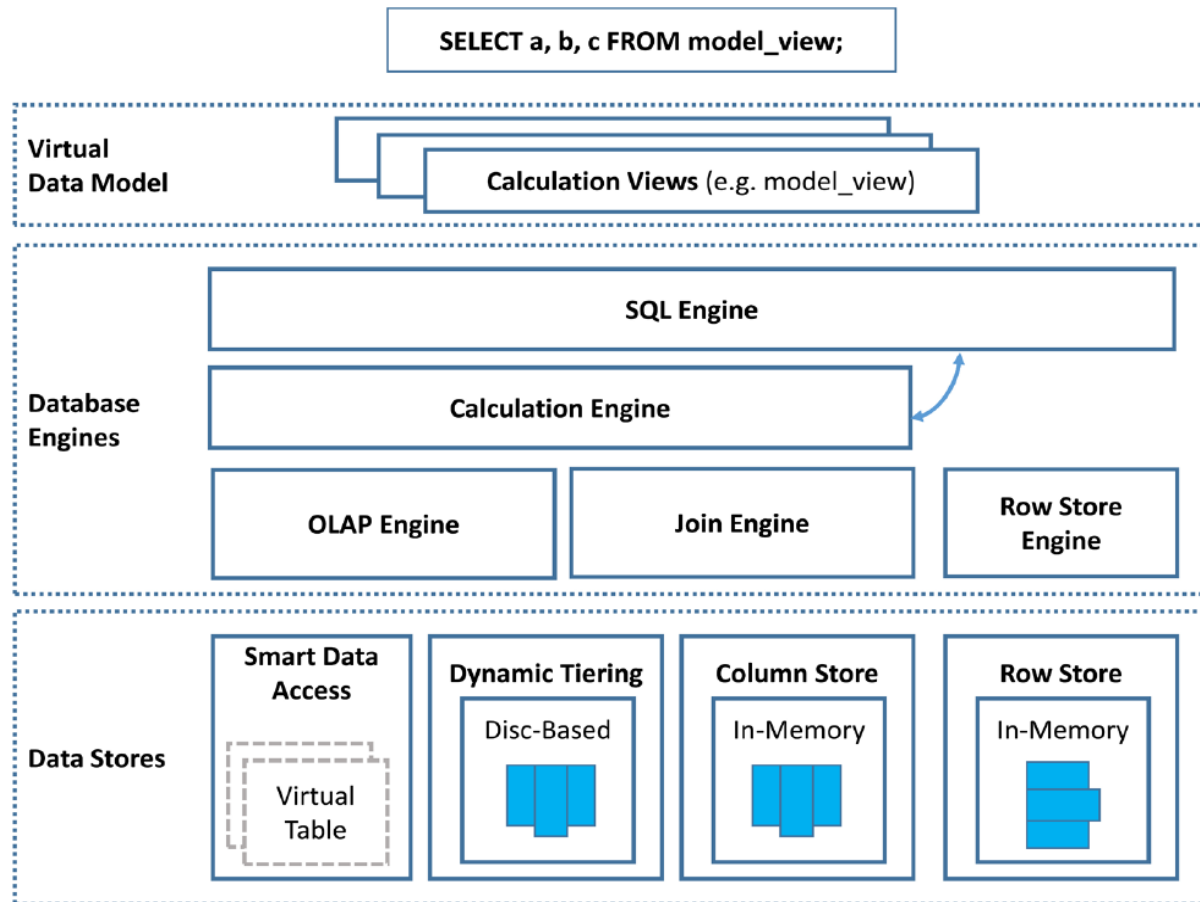


NetWeaver

SAP BW in SAP NetWeaver



SAP-HANA

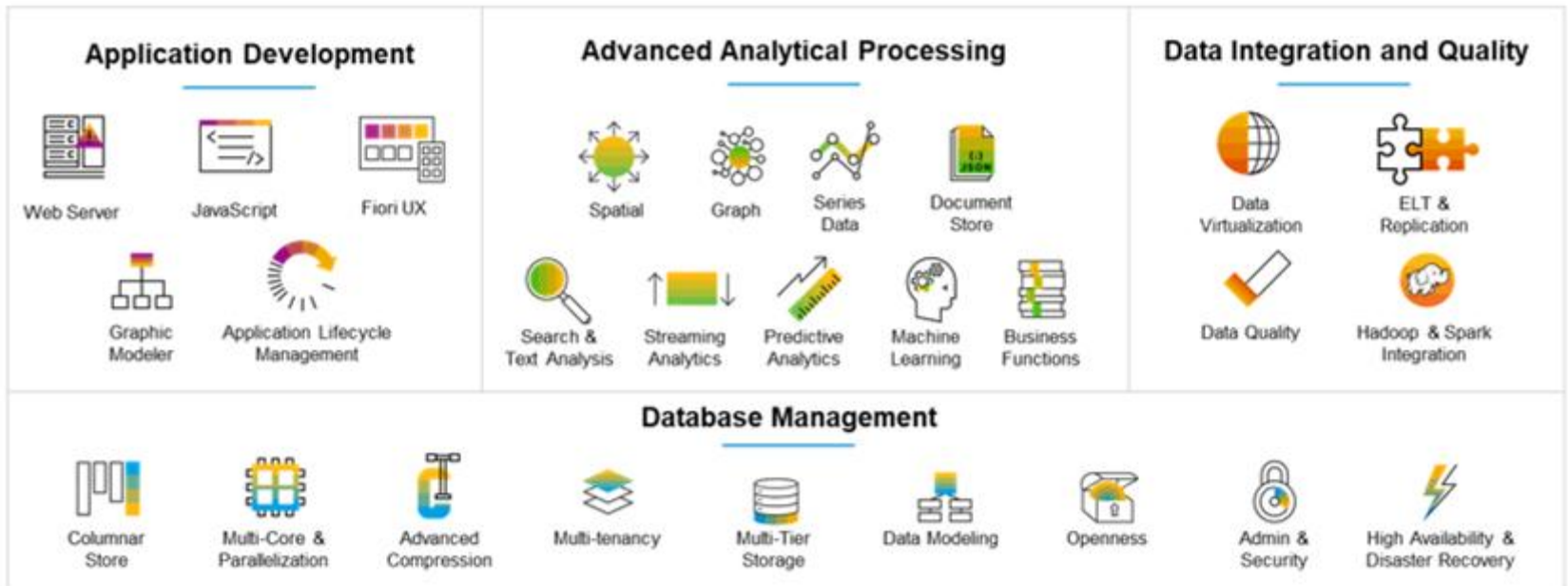


Journal of Computer and Communications, 2017, 5, 1-10

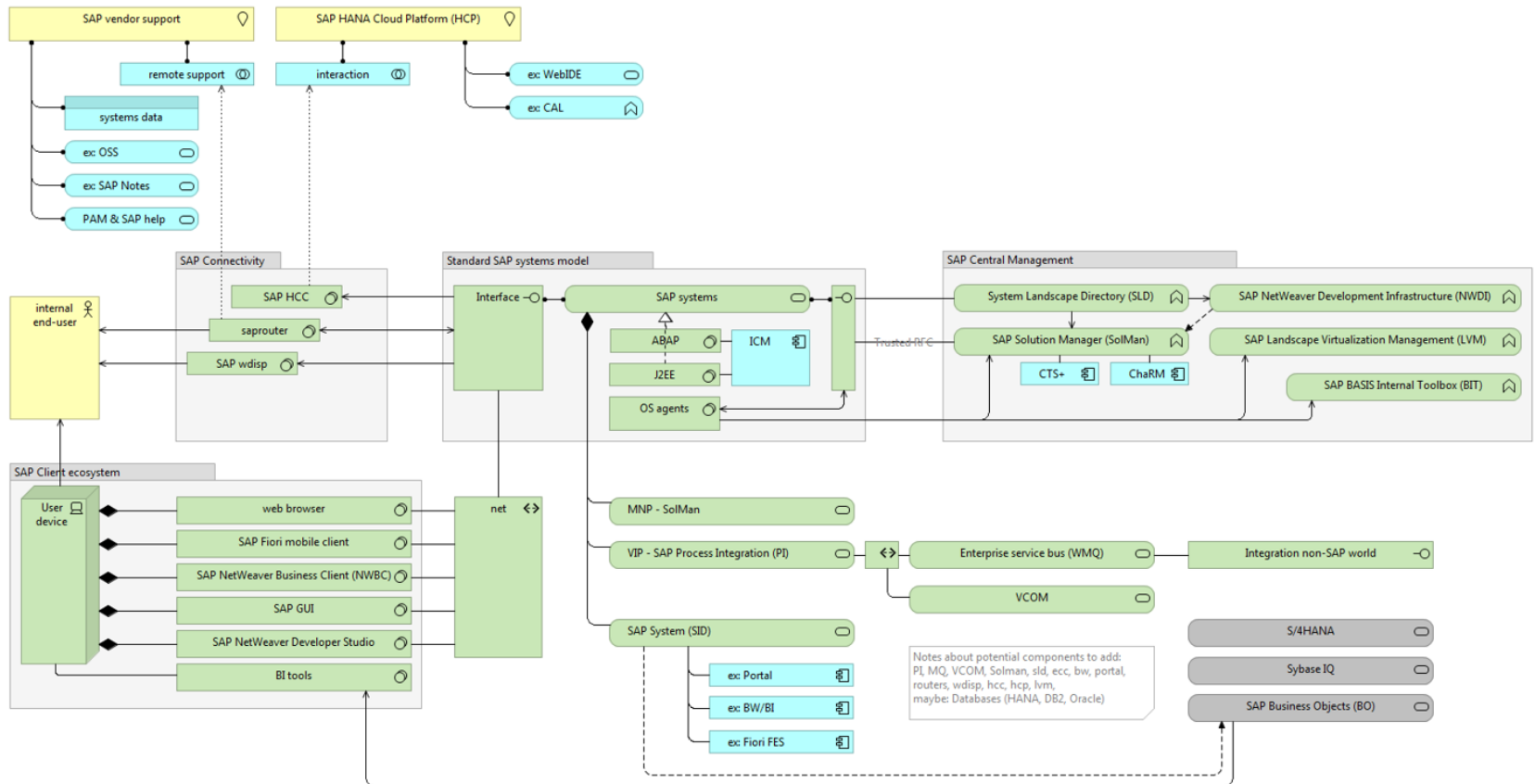
<http://www.scirp.org/journal/jcc>

ISSN Online: 2327-5227

SAP-HANA

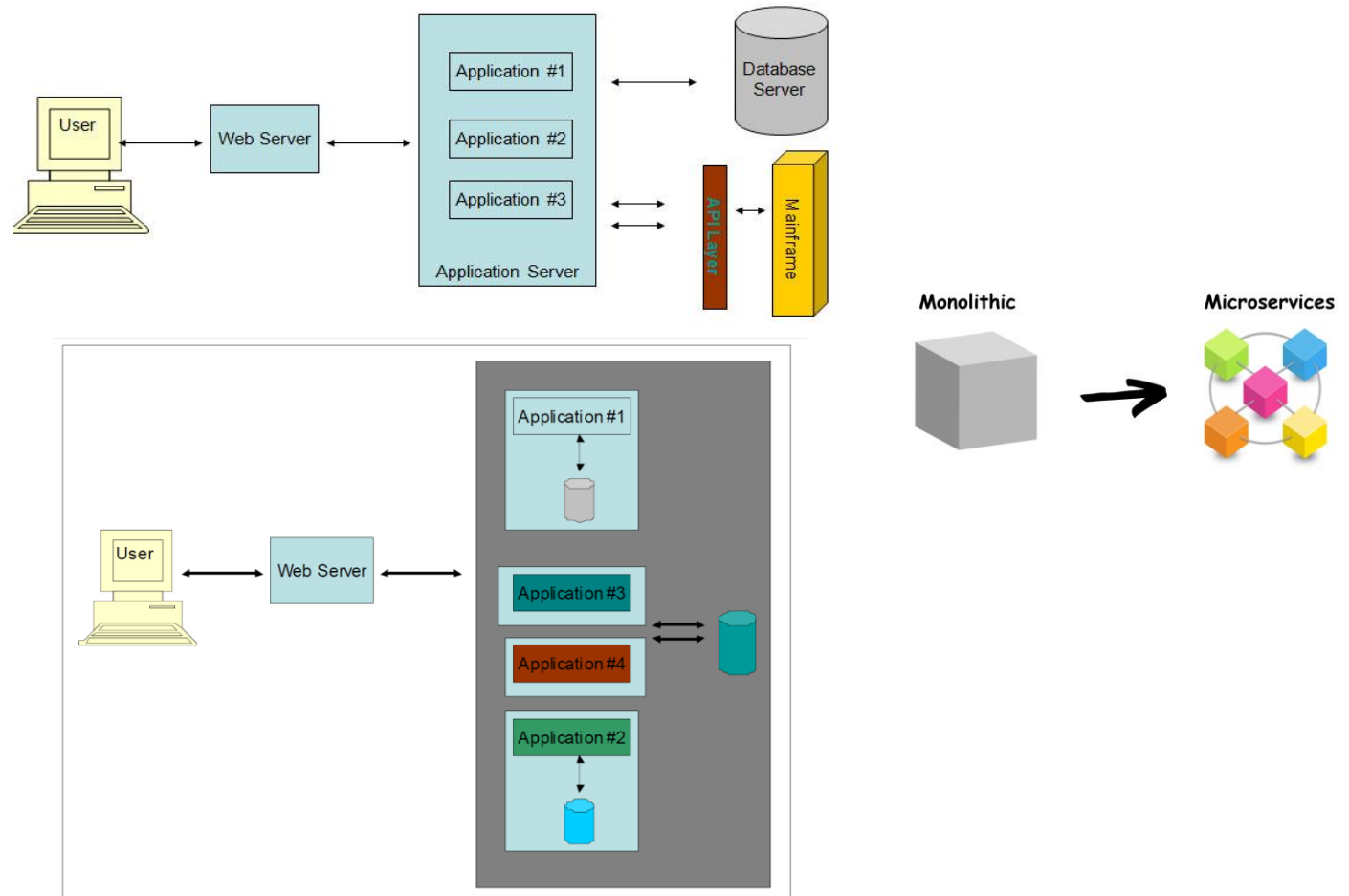


Architektura SAP



<https://www.linkedin.com/pulse/blast-from-past-archimate-explain-sap-wim-van-hooste>

Architektury microserwisów



Microservices from Theory to Practice: Creating Applications in IBM Bluemix Using the Microservices Approach. An IBM Redbooks publication

Architektury - porównanie

Architektura	Podstawowe własności	Zalety	Wady
Two-tier	Model klient-serwer	Ta sama wydajność przy zmniejszonych zasobach	Słaba skalowalność, duże koszty integracji
Three-tier	Separacja danych, aplikacji i warstwy prezentacji	Skalowalność, odporność na awarie i bezpieczeństwo	Więcej zasobów, złożoność środowiska
Web based	Wykorzystanie web-services i web protokołów	Łatwość dostępu do informacji, mniejsze przerwy w pracy systemu	Zależność od protokołów i zwiększona złożoność
SOA	Dekompozycja logiki biznesowej na mniejsze jednostki	Skalowalność i elastyczność, zmniejszone koszty integracji, ponowne wykorzystanie komponentów	Większe koszty implementacji, narzuty na kontrole usług
Cloud-based	Hostowanie usług ERP poza firmą lub na chmurze prywatnej	Skalowalność, odporność na awarie i bezpieczeństwo	Szybkie łącza sieciowe, bezpieczeństwo danych, cena zależna od wykorzystania

ES