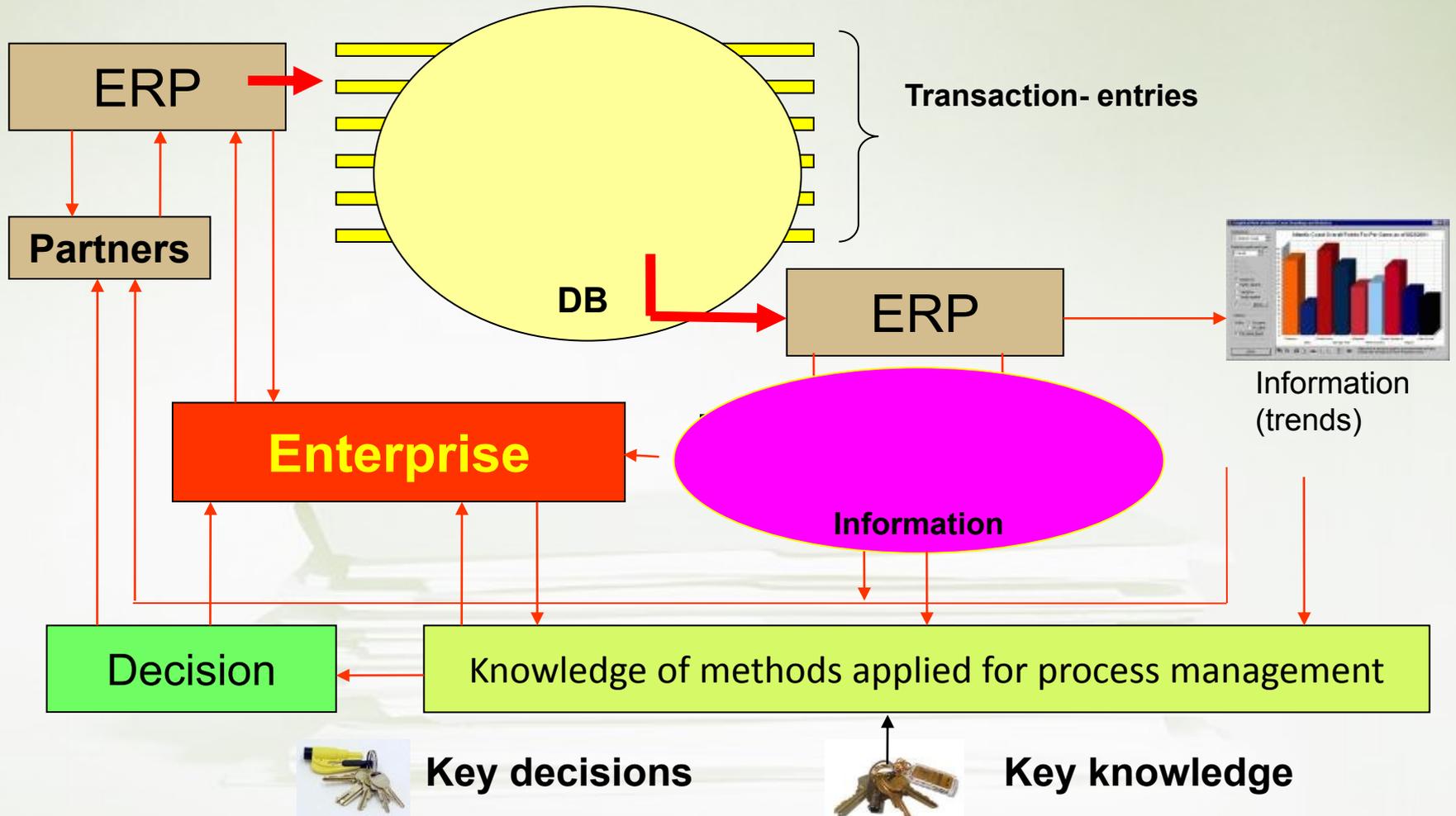


# BASIC ERP ARCHITECTURE

Skorkovský, KPH, ESF MU, Brno



# Simplified schema of ERP usage



# Methods

- Theory of constraint
- Critical chain
- DBR
- Ishikawa Fishbone Diagram
- Boston matrix and PLC
- Magic Matrix (Gartner)
- Use of ERP analytic tools
- Pareto analysis
- SWOT (basic and advanced)
- MRP,MRP-II,CONWIP,
- Advanced Planning and scheduling
- Linear programming
- Methods of quality management

# What could be controlled...



# ERP

The main objective of **Enterprise Resource Planning**, or ERP, is to integrate all departments and functions across a company into a single system by using a common database, the value of which is to be able to have only one correct set of data.



# Isolated Data Islands

Accounting  
Island



Marketing

Marketing  
& Sales  
Islands



Accounting

Production  
Island



Customer  
Orders



Sales  
Representatives



Customers



Production  
Planning

Island of  
Deliveries



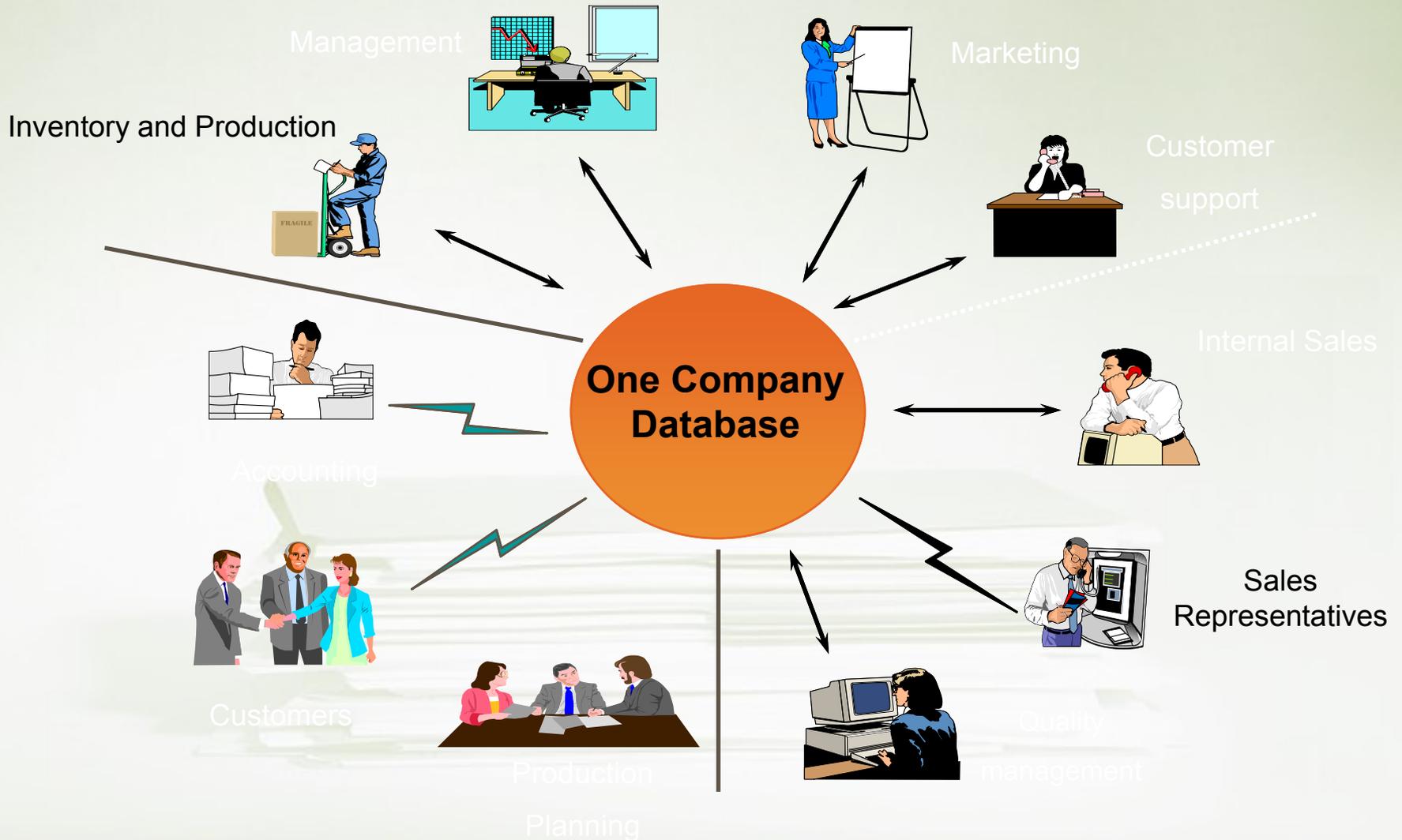
Quality Management

Quality  
Management  
Island



Inventory and Production

# One Solution ● One Database ● All Microsoft

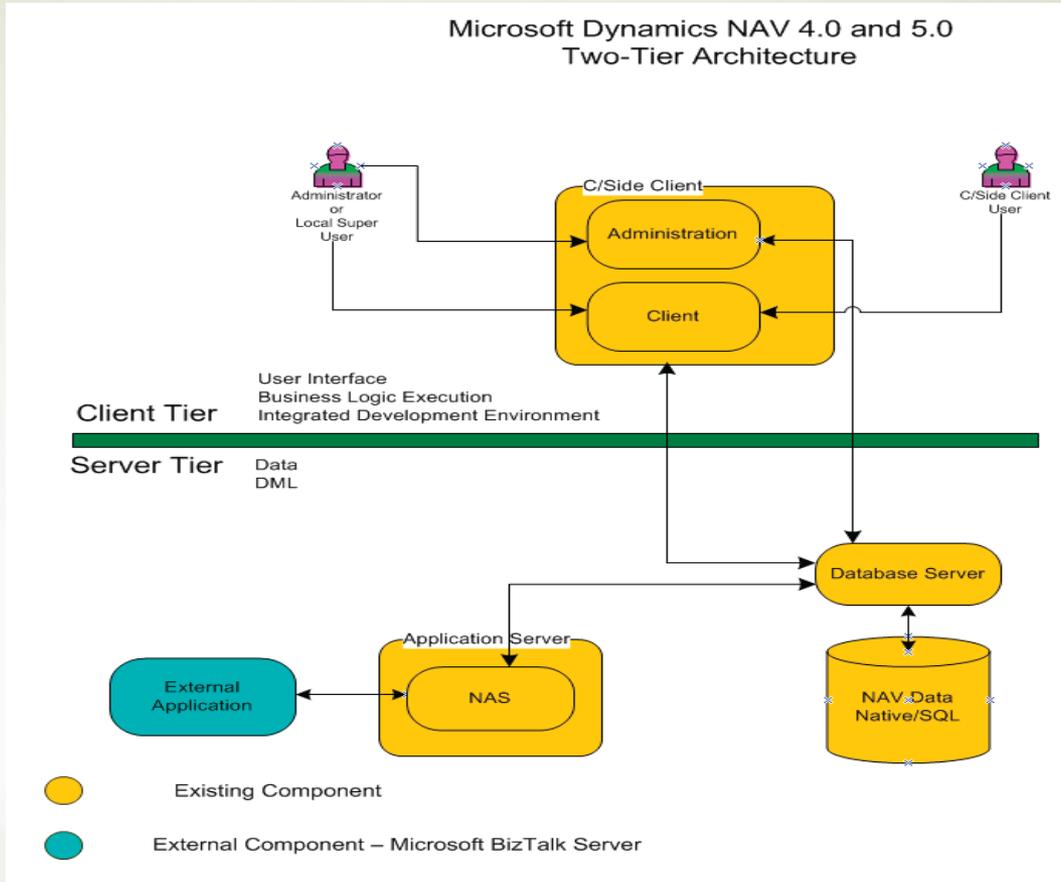


# ISLAND SYSTEMS

For example, records about inventory levels may be found in one database, while customer information may be found in its own separate database. Furthermore, these databases may be "island systems" (operating independently from each other and having no integration with other databases).

Warehouse data (examples)	Production Data (examples)	Sales & Customer Data (examples)
<ul style="list-style-type: none"><li>• Physical location of items</li><li>• Actual stock count</li><li>• Number of items on hold (pending quality inspection)</li></ul>	<ul style="list-style-type: none"><li>• Number of items to be produced</li><li>• Number of items already produced</li><li>• Capacity</li></ul>	<ul style="list-style-type: none"><li>• Open sales orders</li><li>• Confirmed sales orders</li><li>• Customer information</li></ul>

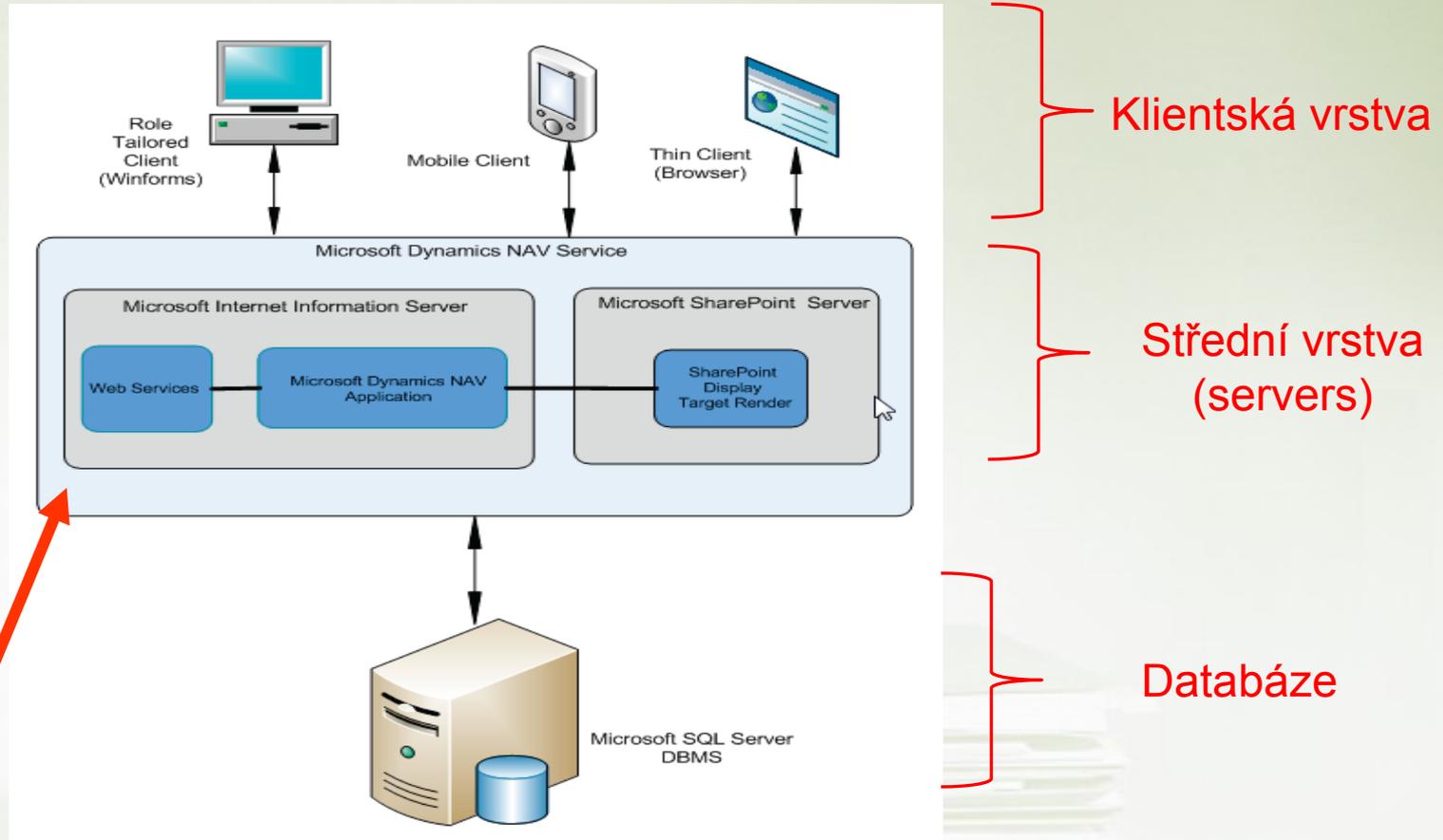
# Architecture 2-tier (2-vrstvy)



Klientská vrstva

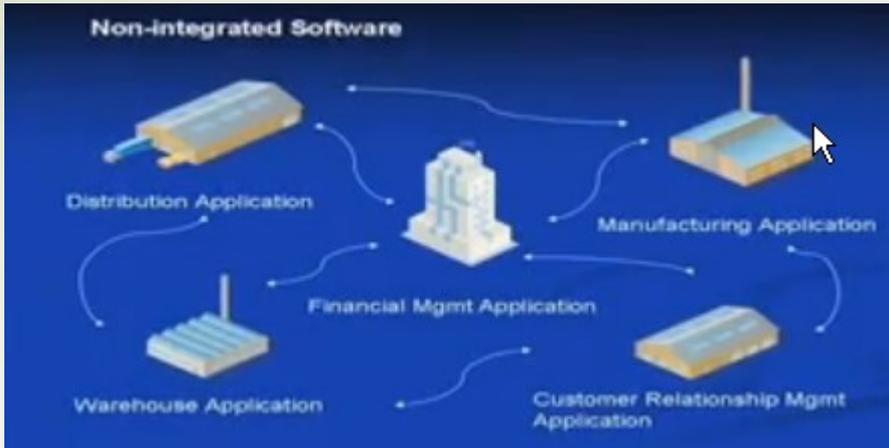
Databáze  
a aplikace

# Architecture 3-tier (3-vrstvy)



The second tier is the multithreaded middle tier. This is the service tier that is based on **Web services.**

# From hell to paradise –ERP (see meaning)



You can change a business in order to copy rigid functions of the software ERP

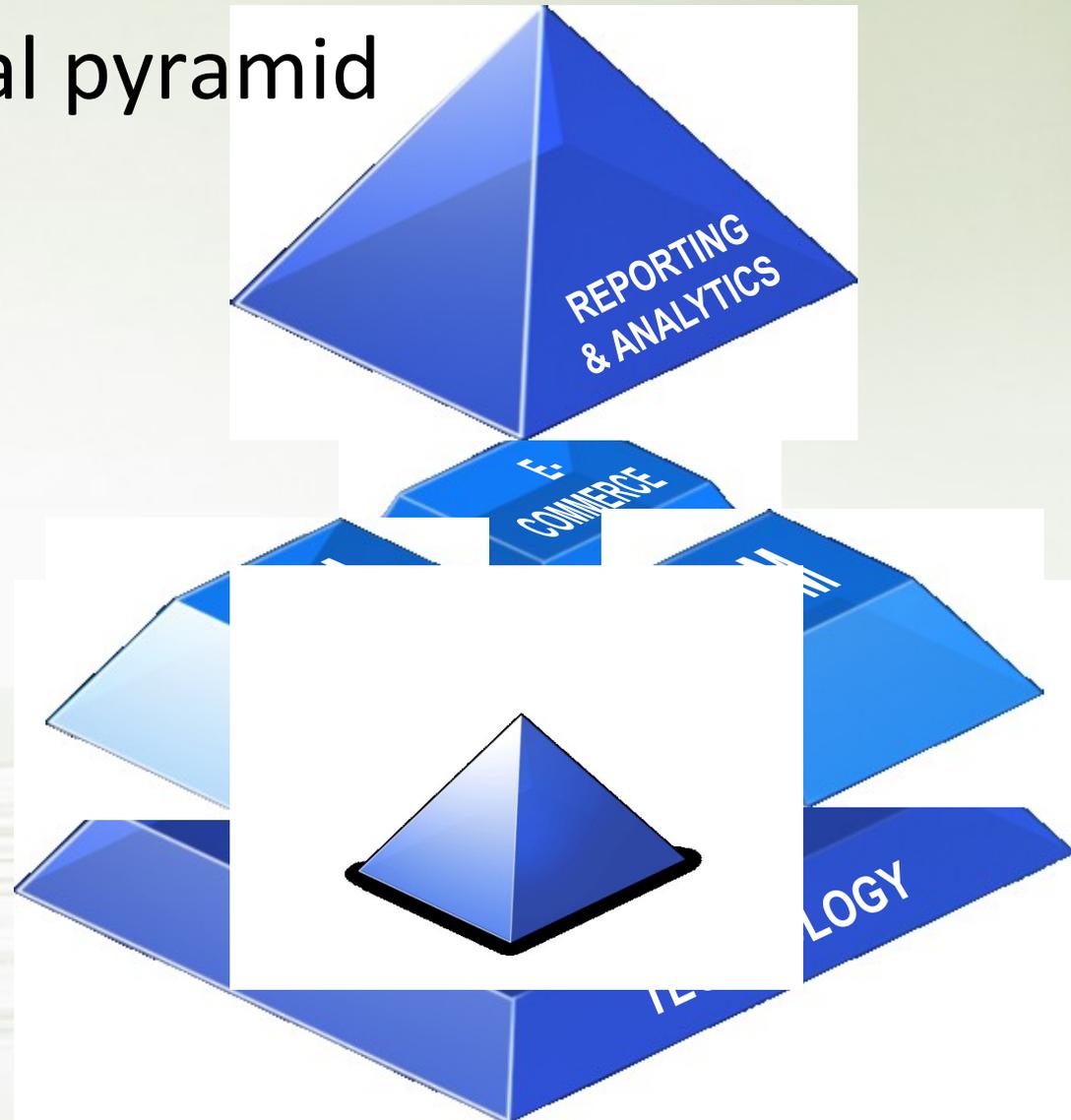
Programming

You can change a software in order to support your business

Parameter setup

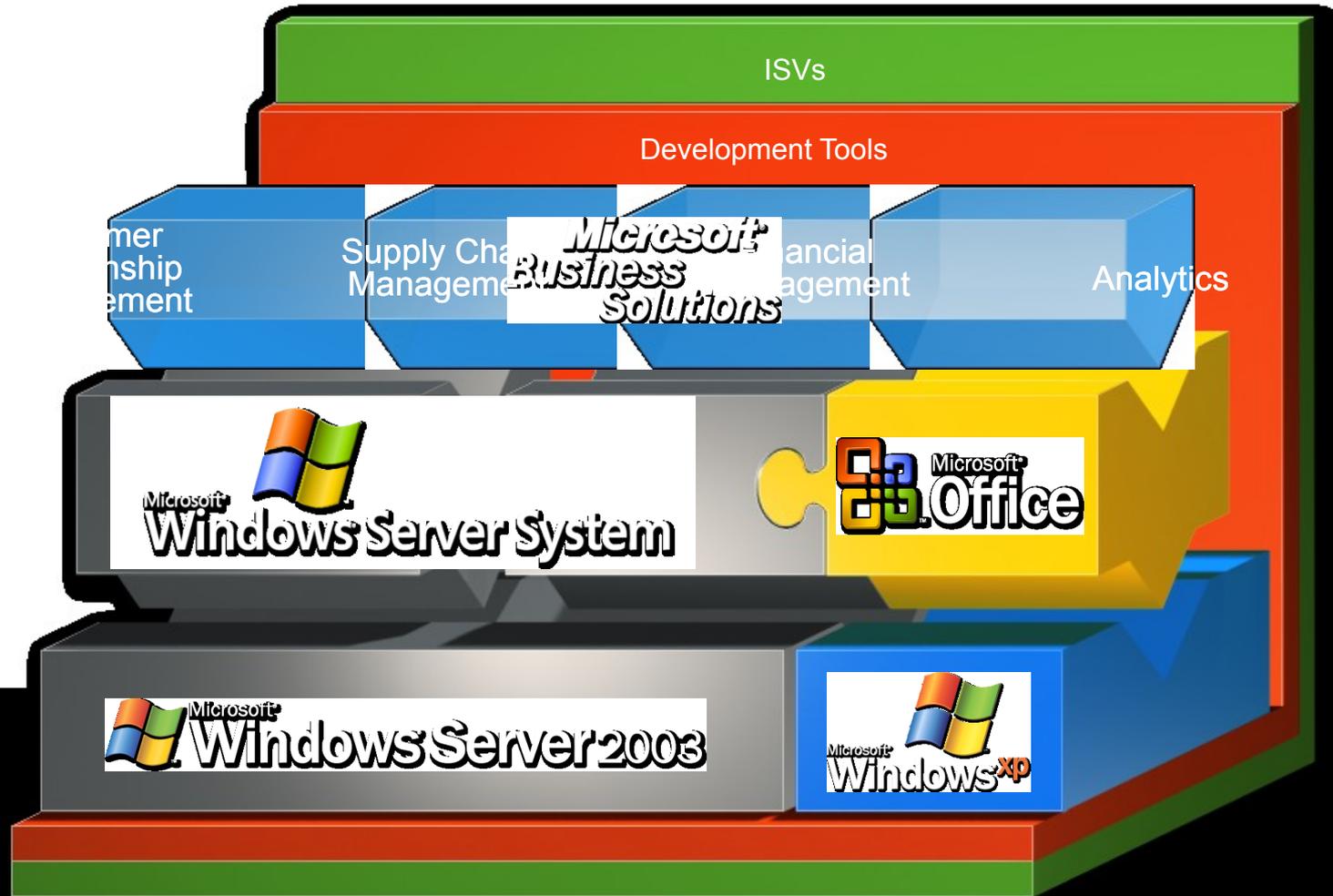


# Technological pyramid



MICROSOFT  
BUSINESS  
SOLUTIONS  
- NAVISION

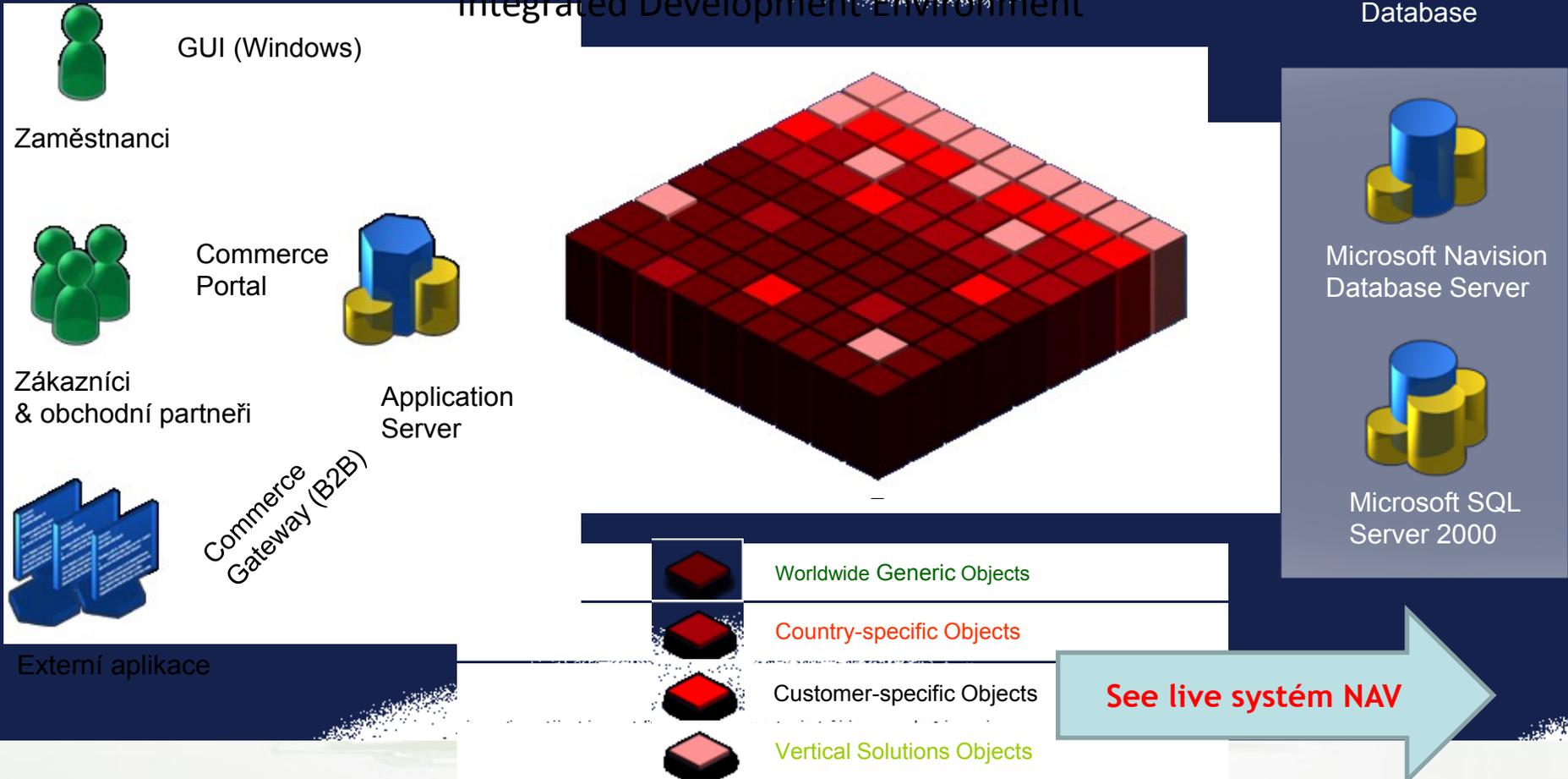
# Integrated homogeneous solution



# Unique architecture

Integrated Development Environment

Database



# Main form (menu, toolbar, forms)

CRONUS CZ s.r.o. - Microsoft Dynamics NAV

File Edit View Tools Window Help

Financial Management

- General Ledger
  - Chart of Accounts
  - Budgets
  - General Journals
  - Analysis & Reporting
  - Intercompany Postings
  - Reports
  - History
  - Periodic Activities
- Cash Management
- Receivables
- Payables
- Fixed Assets
- Inventory
- Setup

Financial Management

Sales & Marketing

Purchase

Warehouse

Manufacturing

Jobs

Resource Planning

Service

Human Resources

Administration

Chart of Accounts

Name	Income/Balance	Totaling	Account Type	Gen. Posting Type	Gen. Bus. Posting Group	Gen. Prod. Posting Group	Net Change	Bal
Režie, kapacita	Income Statement		Posting					
Nákupní odchylka, kapacita	Income Statement		Posting					
<b>Celkové náklady na kapac...</b>	Income Statement	511050..511990	End-Total					
Travel expenses	Income Statement		Posting	Purchase		BEZ DPH	1 012 816,40	
Režie, suroviny	Income Statement		Posting					
Entertainment costs	Income Statement		Posting				149 170,50	
<b>Other services</b>	Income Statement		Begin-Total	Purchase	NÁRODNÍ	SLUŽBY		
Cleaning	Income Statement		Posting	Purchase	NÁRODNÍ	SLUŽBY	992 215,91	
<b>Overhead services</b>	Income Statement		Begin-Total	Purchase	NÁRODNÍ	SLUŽBY		
Phones	Income Statement		Posting	Purchase	NÁRODNÍ	SLUŽBY	2 029 440,00	
Postage	Income Statement		Posting	Purchase	NÁRODNÍ	BEZ DPH	121 574,70	
Other overhead services	Income Statement		Posting	Purchase	NÁRODNÍ	RŮZNÉ		
<b>Overhead services, Total</b>	Income Statement	518205..518295	End-Total				2 151 014,70	
Advertising	Income Statement		Posting	Purchase	NÁRODNÍ	RŮZNÉ	3 834 471,87	
<b>Rent and renting</b>	Income Statement		Begin-Total					
Renting of operational sp...	Income Statement		Posting					
Renting of vehicles	Income Statement		Posting					
<b>Rent and renting</b>	Income Statement	518405..518495	End-Total					

Account Balance Functions Help

Net Change: 18.12.08 FILTER

Start Odeslaná pošta ... 2 Microsoft Of... TEMPORARY OP... Angličtina - Lexi... CRONUS CZ s.r.... CS 10:19

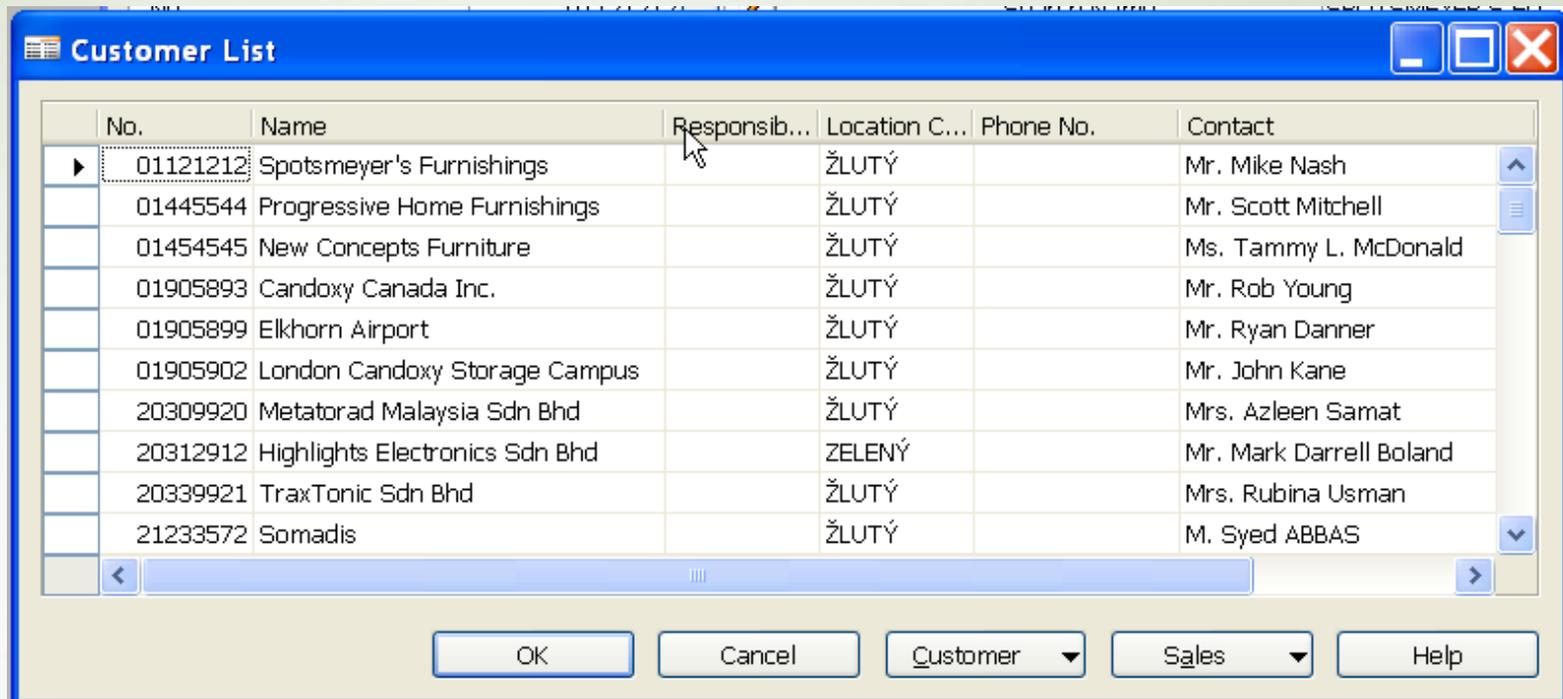
# Main forms (card, list, form->sub-form)

The screenshot shows a software window titled "01121212 Spotsmeyer's Furnishings - Customer Card". The window has a blue title bar with standard minimize, maximize, and close buttons. Below the title bar are several tabs: "General" (selected), "Communication", "Invoicing", "Payments", "Shipping", and "Foreign Trade". The main area contains a form with two columns of fields. The left column includes: "No." (01121212), "Name" (Spotsmeyer's Furnishings), "Address" (612 South Sunset Drive), "Address 2" (empty), "Post Code/City" (US-FL 37125, Miami), "Country/Region Code" (US), "Phone No." (empty), "Primary Contact No." (empty), and "Contact" (Mr. Mike Nash). The right column includes: "Search Name" (SPOTSMeyer's FU...), "Balance (LCY)" (0,00), "Credit Limit (LCY)" (0,00), "Salesperson Code" (JM), "Responsibility Center" (empty), "Service Zone Code" (X), "Blocked" (empty), and "Last Date Modified" (09.06.08). At the bottom of the window are four buttons: "Customer" (with a dropdown arrow), "Sales" (with a dropdown arrow), "Functions" (with a dropdown arrow), and "Help".

No. . . . .	01121212	Search Name. . . . .	SPOTSMeyer's FU...
Name . . . . .	Spotsmeyer's Furnishings	Balance (LCY) . . . . .	0,00
Address . . . . .	612 South Sunset Drive	Credit Limit (LCY) . . . . .	0,00
Address 2 . . . . .		Salesperson Code . . . . .	JM
Post Code/City . . . . .	US-FL 37125 Miami	Responsibility Center . . . . .	
Country/Region Code . . . . .	US	Service Zone Code . . . . .	X
Phone No. . . . .		Blocked . . . . .	
Primary Contact No. . . . .		Last Date Modified . . . . .	09.06.08
Contact . . . . .	Mr. Mike Nash		

Customer Sales Functions Help

# Main forms (card, **list**, form->sub-form)



The screenshot shows a window titled "Customer List" with a table of customer data. The table has columns for No., Name, Responsib..., Location C..., Phone No., and Contact. The first row is selected, and a mouse cursor is pointing at the "Responsib..." column header. Below the table are several control buttons: "OK", "Cancel", "Customer" (with a dropdown arrow), "Sales" (with a dropdown arrow), and "Help".

No.	Name	Responsib...	Location C...	Phone No.	Contact
01121212	Spotsmeyer's Furnishings		ŽLUTÝ		Mr. Mike Nash
01445544	Progressive Home Furnishings		ŽLUTÝ		Mr. Scott Mitchell
01454545	New Concepts Furniture		ŽLUTÝ		Ms. Tammy L. McDonald
01905893	Candoxy Canada Inc.		ŽLUTÝ		Mr. Rob Young
01905899	Elkhorn Airport		ŽLUTÝ		Mr. Ryan Danner
01905902	London Candoxy Storage Campus		ŽLUTÝ		Mr. John Kane
20309920	Metatorad Malaysia Sdn Bhd		ŽLUTÝ		Mrs. Azleen Samat
20312912	Highlights Electronics Sdn Bhd		ZELENÝ		Mr. Mark Darrell Boland
20339921	TraxTonic Sdn Bhd		ŽLUTÝ		Mrs. Rubina Usman
21233572	Somadis		ŽLUTÝ		M. Syed ABBAS

# Main forms (card, list, **form->sub-form**)

101018 New Concepts Furniture - Sales Order

General Invoicing Shipping Foreign Trade E - Commerce Prepayment Advance Invoice

No. . . . . 101018 [edit] Posting Date . . . . . 25.01.08  
Sell-to Customer No. . . . . 01454545 [up] VAT Settlement Date . . . . . 25.01.08  
Sell-to Contact No. . . . . [up] Order Date . . . . . 25.01.08  
Sell-to Customer Name . . . . . New Concepts Furniture Document Date . . . . . 25.01.08  
Sell-to Address . . . . . 705 West Peachtree Street Requested Delivery Date . . . . . [ ]  
Sell-to Address 2 . . . . . [ ] Promised Delivery Date . . . . . [ ]  
Sell-to Post Code/City . . . . . US-GA 31772 [up] Atlanta [up] Quote No. . . . . [ ]  
Sell-to Contact . . . . . Ms. Tammy L. McDonald External Document No. . . . . [ ]  
No. of Archived Versions . . . . . 0 Salesperson Code . . . . . JM [up]  
Reason Code . . . . . [up] Campaign No. . . . . [up]  
Responsibility Center . . . . . [up]  
Status . . . . . Open

Customer Information

Sell-to Customer [edit]  
• Ship-to Addresses (0)  
• Contacts (2)  
Bill-to Customer  
• Avail. Credit 0

Partner

Type	No.	Purch... Code	Drop Shipment	Description	Location Code	Quantity	Reserved Quantity	U
Item	1980-S		<input type="checkbox"/>	MOSCOW Swivel Chair, red	ZELENÝ	6		k ^

Item Information

• Item Card [edit]  
• Availability (8)  
• Substitutions (1)  
• Sales Prices (0)  
• Sales Line Dis... (1)

Order Line Functions Posting Print Help

What

# Table->Form principle

Field No.	Field Name	Data Type	Length
1	No.	Code	20
2	Name	Text	50
3	Search Name	Code	50
4	Name 2	Text	50
5	Address	Text	50
6	Address 2	Text	50
7	City	Text	30
8	Contact	Text	50
9	Phone No.	Text	30
10	Telex No.	Text	20
14	Our Account No.	Text	20
15	Territory Code	Code	10
16	Global Dimension 1 Code	Code	20
17	Global Dimension 2 Code	Code	20
18	Chain Name	Code	10
19	Budgeted Amount	Decimal	
20	Credit Limit (LCY)	Decimal	
21	Customer Posting Group	Code	10
22	Currency Code	Code	10
23	Customer Price Group	Code	10
24	Language Code	Code	10



General Communication **Invoices** Payments Shipping Foreign Trade

No. . . . . 01121212 Search Name . . . . . SPOTSMAYER'S FU...

Name . . . . . Spotsmeyer's Furnishings Balance (LCY) . . . . . 0,00

Address . . . . . 612 South Sunset Drive Credit Limit (LCY) . . . . . 0,00

Address 2 . . . . . Salesperson Code . . . . . JM

Post Code/City . . . . . US-FL 37125 Miami Responsibility Center . . . . .

Country/Region Code . . . . . US Service Zone Code . . . . . X

Phone No. . . . . Blocked . . . . .

Primary Contact No. . . . . Last Date Modified . . . . . 09.06.08

Contact . . . . . Mr. Mike Nash

Form (Card,Window), which is object as well and it is used to display data stored in the Table (object)

Specification of fields in Table (object)

# Table x->Table y relations

01121212 Spotsmeyer's Furnishings - Customer Card

General Communication Invoicing Payments Shipping Foreign Trade

No. 01121212 Search Name SPOTSMYER'S FU...

Name Spotsmeyer's Furnishings Balance (LCY) 0,00

Address 612 South Sunset Drive Credit Limit (LCY) 0,00

Address 2

Post Code/City **US-FL 37125** Miami

Country/Region Code US Salesperson Code JM

Phone No.

Primary Contact No.

Contact Mr. Mike Nash Responsibility Center Service Zone Code X Blocked Last Date Modified 09.06.08

Customer Sales Functions Help

Post Codes

Code	City
UG-KLA	Kampala
US-AL 35...	Birmingham
<b>US-FL 37125</b>	Miami
US-GA 31...	Atlanta

X= Customer  
Y=Post Code

✓	84 Fax No.	Text
✓	85 Telex Answer Back	Text
✓	86 VAT Registration No.	Text
✓	87 Combine Shipments	Boolean
✓	88 Gen. Bus. Posting Group	Code
✓	89 Picture	BLOB
✓	<b>91 Post Code</b>	<b>Code</b>
✓	92 County	Text

## CRONUS CZ s.r.o. - Microsoft Dynamics NAV - [Table Relation]

Table	Field
Post Code	↑

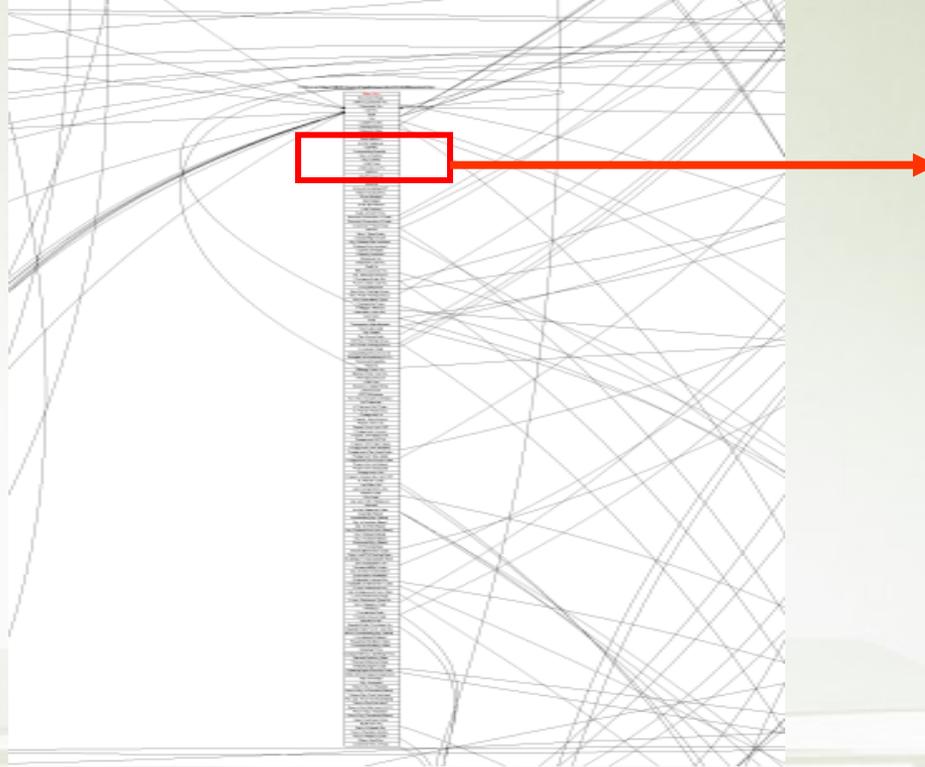
## CRONUS CZ s.r.o. - Microsoft Dynamics NAV - [Post Code - Properties]

DateFormula	<No>
ValuesAllowed	<>
SQL Data Type	<Undefined>
<b>TableRelation</b>	<b>"Post Code"</b>
ValidateTableRelation	No
TestTableRelation	No

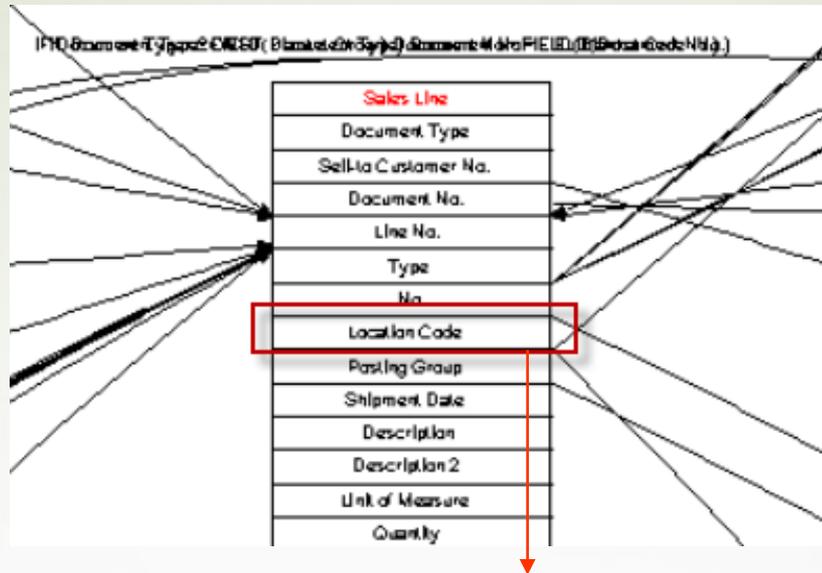




# One table and its relations I



# One table (Sales Line) and its relations II



ERP NAV

ERP NAV interface showing a table of sales lines and an 'Item Information' sidebar.

Type	No.	Purch... Code	Drop Shipment	Description	Location Code	Quantity	Reserved Quantity	L
Item	1980-S		<input type="checkbox"/>	MOSCOW Swivel Chair, red	ZELENÝ	6		k ^

Item Information sidebar:

- Item Card (edit icon)
- Availability (8)
- Substitutions (1)
- Sales Prices (0)
- Sales Line Dis... (1)

Buttons: Order, Line, Functions, Posting, Print, Help

# Microsoft Dynamics NAV Sweet Points

- Windows compatible (menu, command, mutual relations to MS Office,..)
- Security (ID, passwords, roles, protocols)
- Menu and basic modules
- Shorthand keys and HELP
- Multilanguage
- Navigate and calculation (flow) fields, finding the reason why any document was created
- Reports
- Entries, dimensions

Balance, Payments,..

# Business Case Principles

Customer Table

Sales Entry in database  
(Type Invoice)

Sales Order  
Header

F11=post

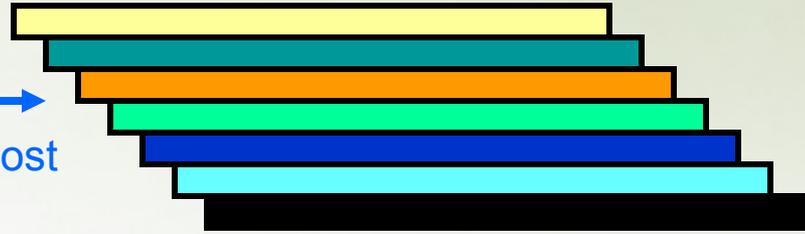
Item Chair 4 pcs 30 EURO

Item Table 1 pcs 100 EURO

Item Table

Item Table

Availability, Costs,...



Entries in General Ledger

Item Ledger Entries  
in database  
(Type Sales)

F11 = posting, booking to G/L,...

Thanks for your attention



22.2.2016