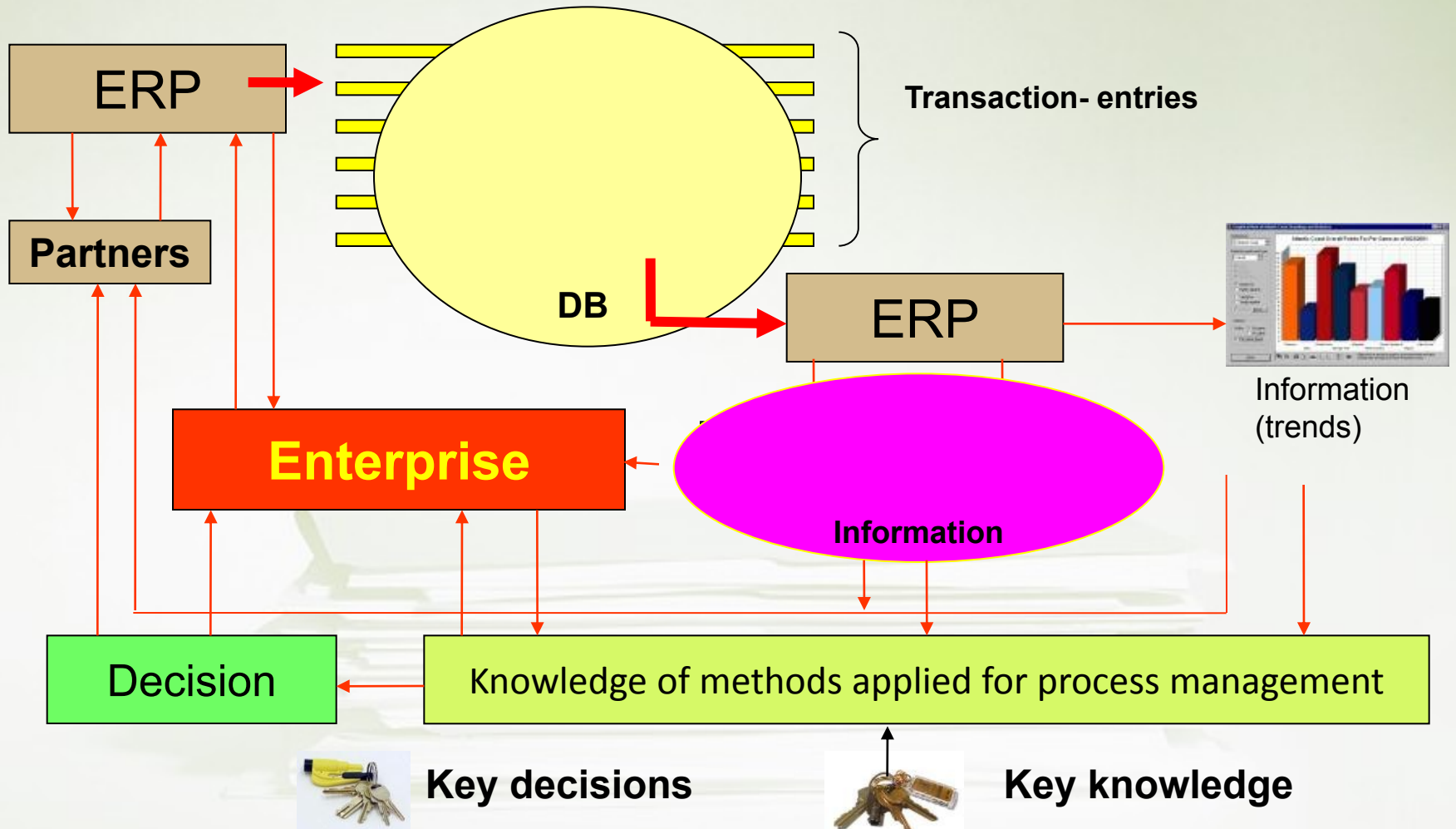


BASIC ERP ARCHITECTURE

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
- SWOT (basic and advanced)
- MRP,PRP-II.CONWIP,
- Advanced Planning and scheduling
-

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



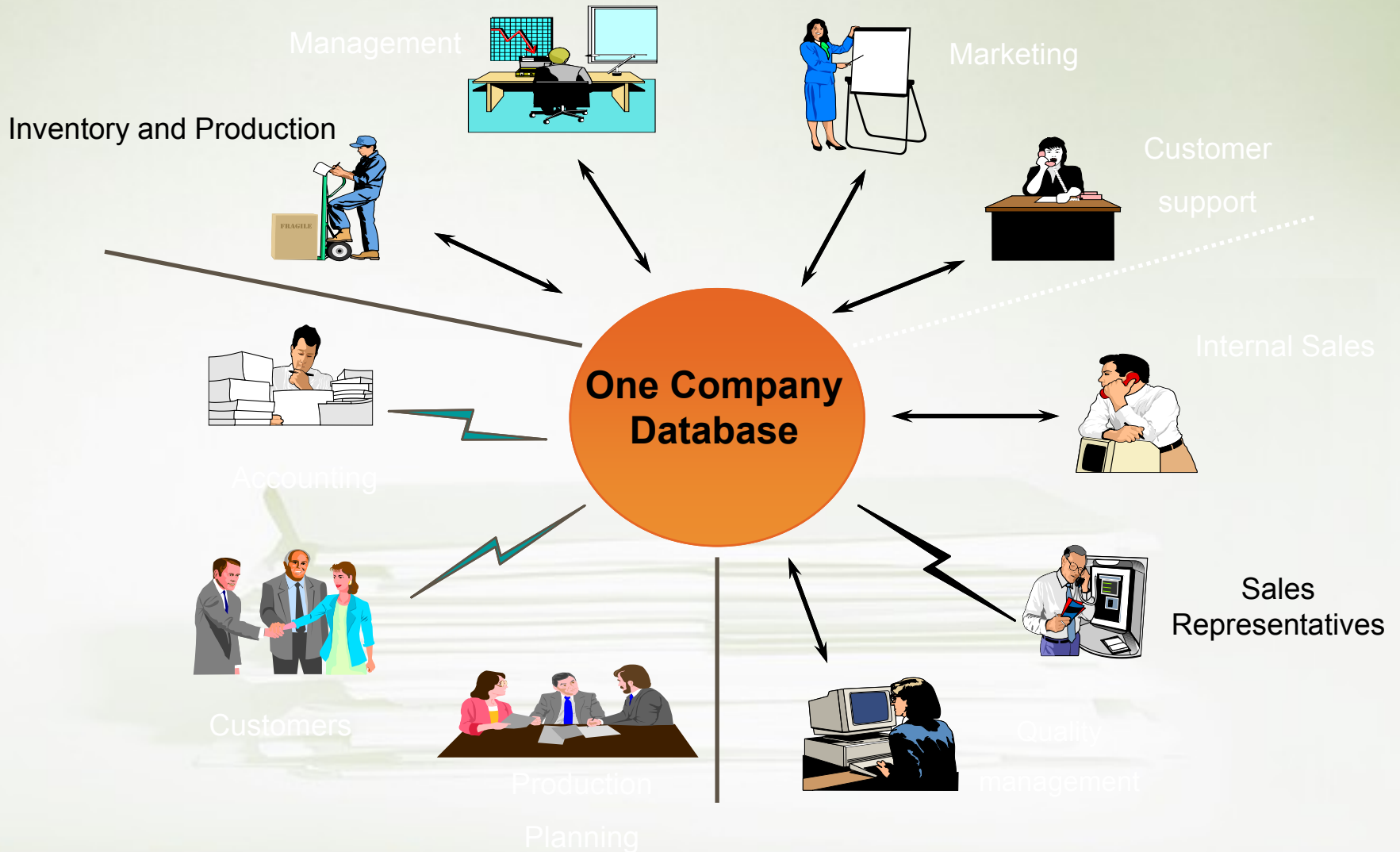
Quality Management

Quality Management Island



Inventory and Production

One Solution ● One Database ● All Microsoft

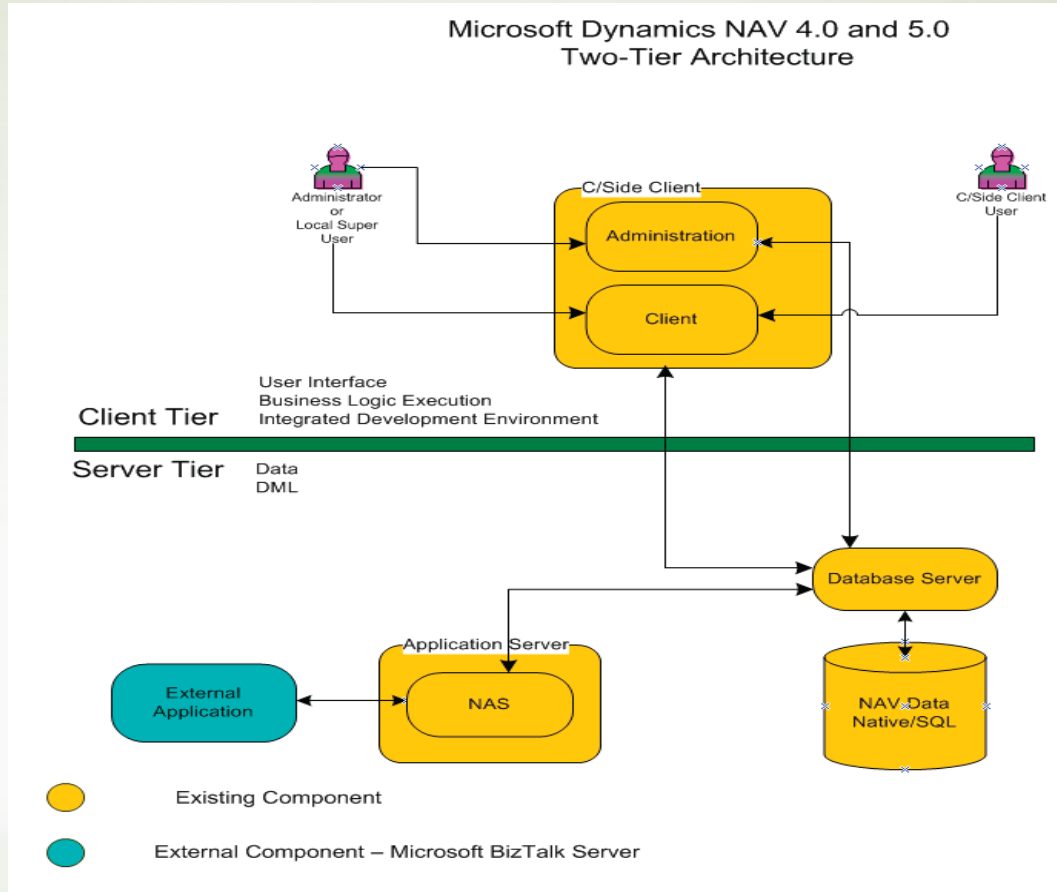


ISLAND SYSTEMS

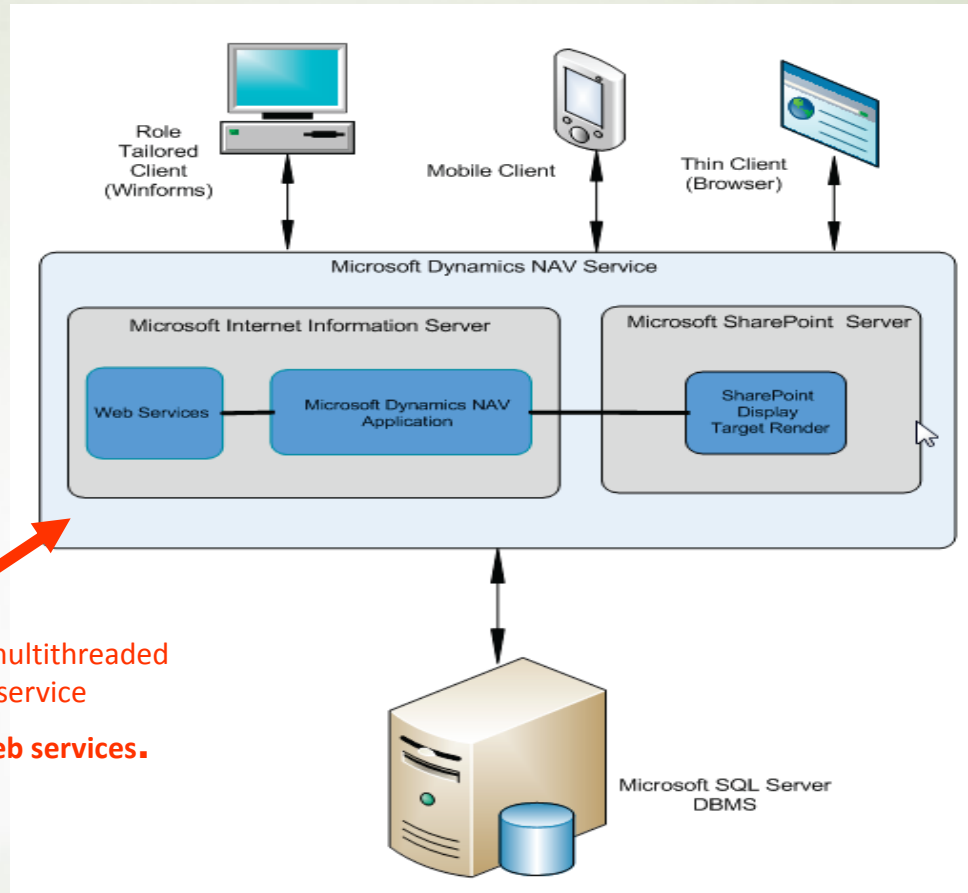
For example, records about inventory levels may be found in one database, while customer information may be found in its own separate database. Furthermore, these databases may be "island systems" (operating independently from each other and having no integration with other databases).

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

Architecture 2-tier (2-vrstvy)



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

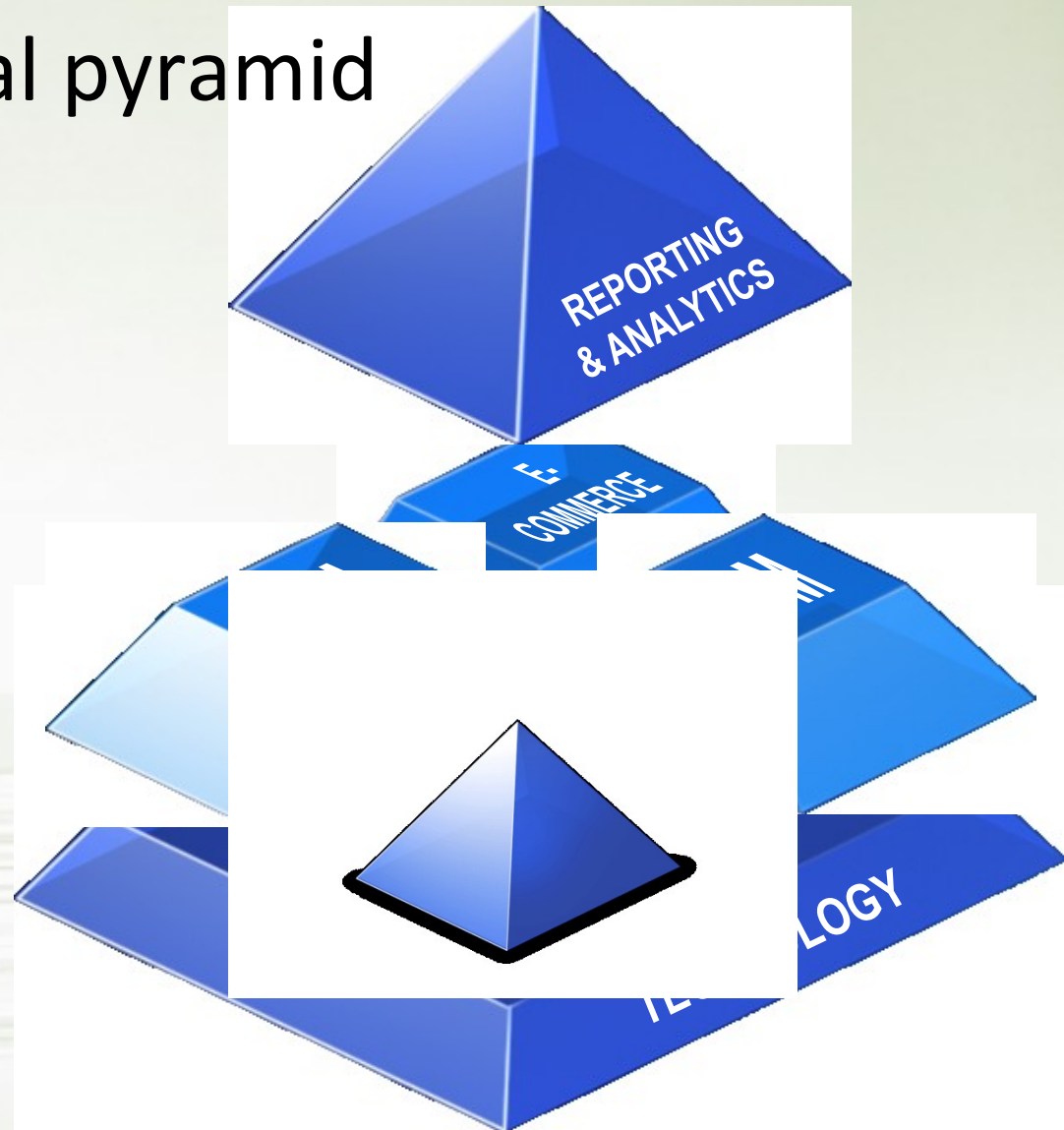
↓
Programming

You can change a software in order to support your business

↑
Parameter setup

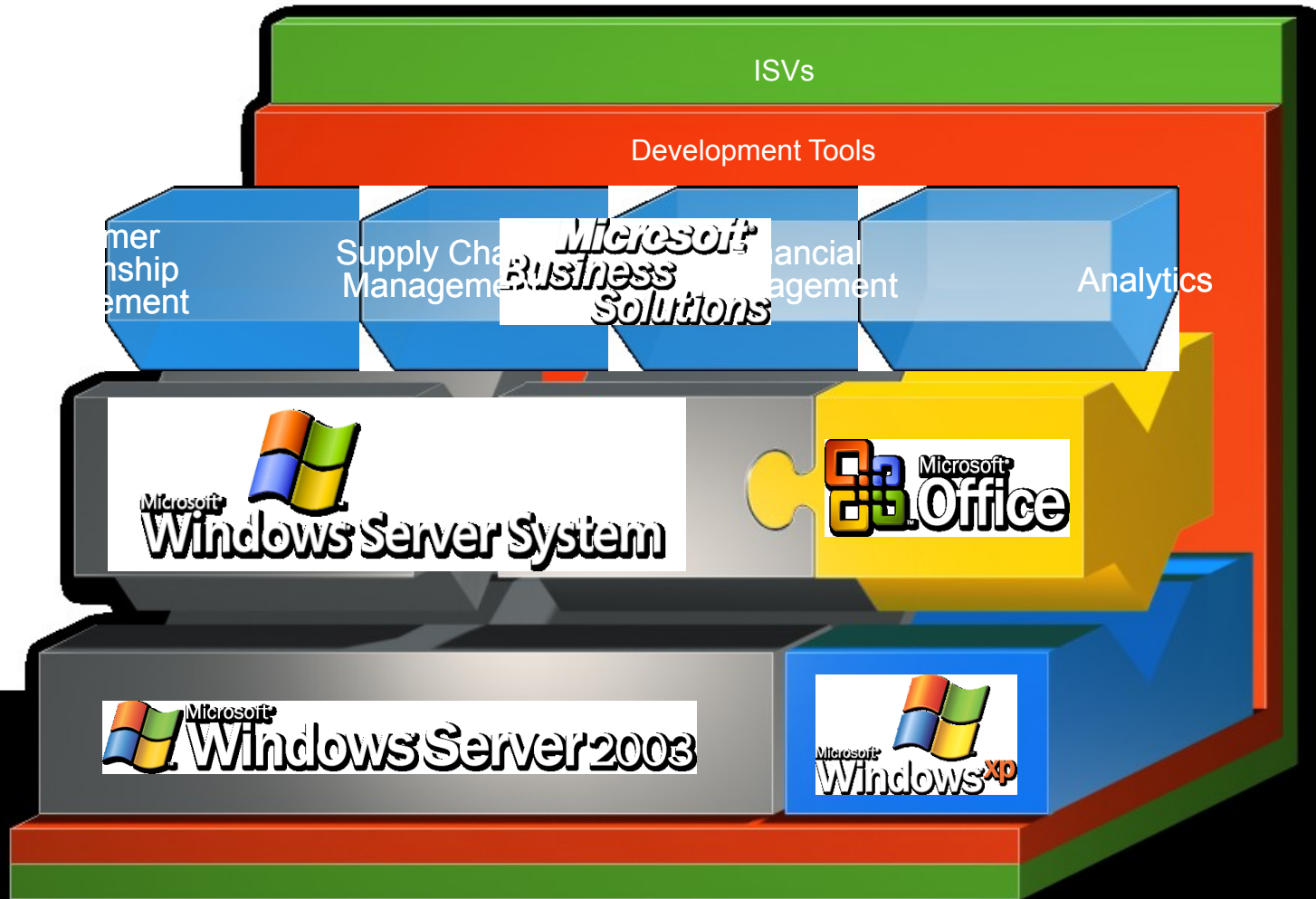


Technological pyramid



MICROSOFT
BUSINESS
SOLUTIONS
- NAVISION

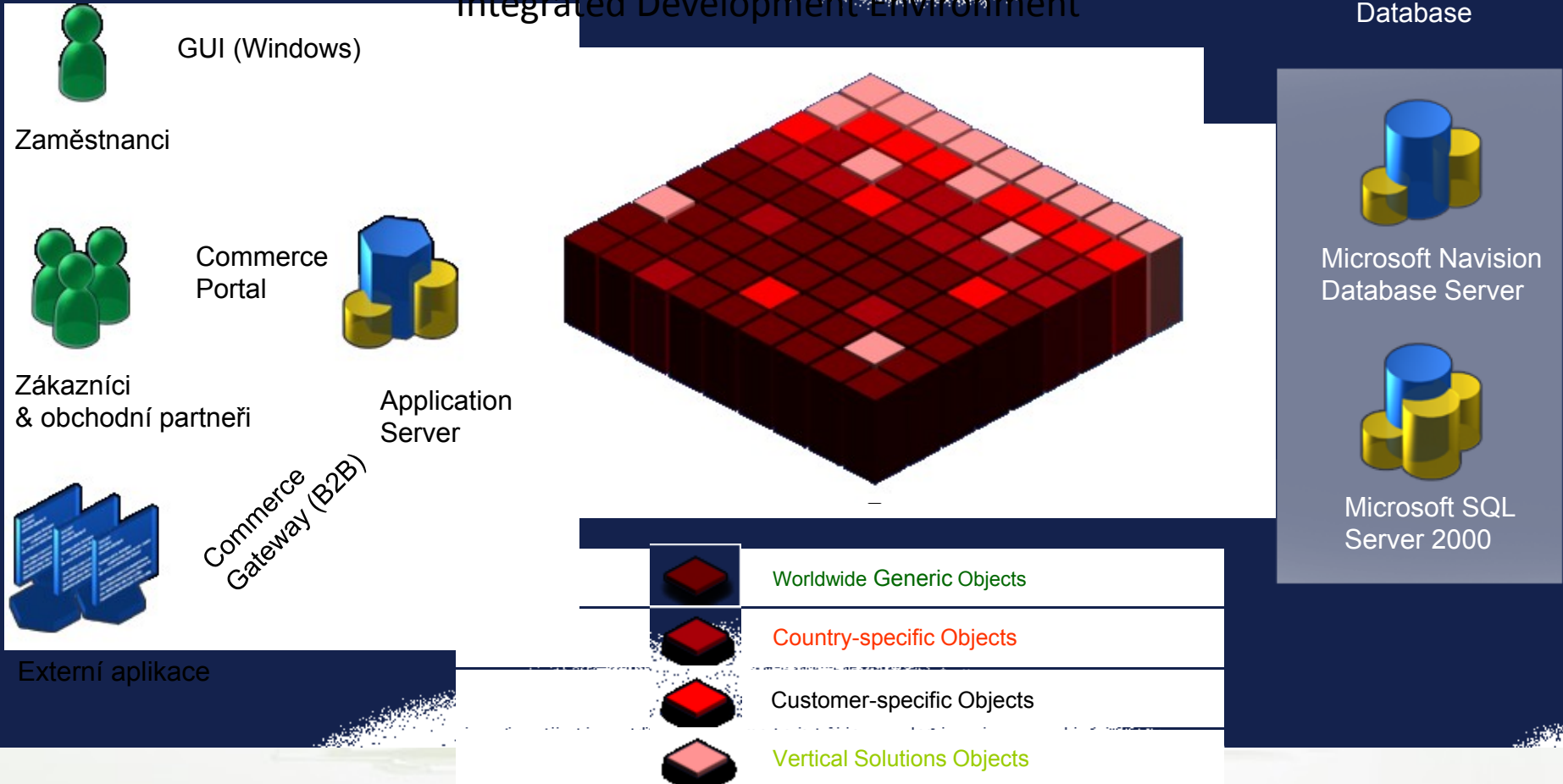
Integrated homogeneous solution



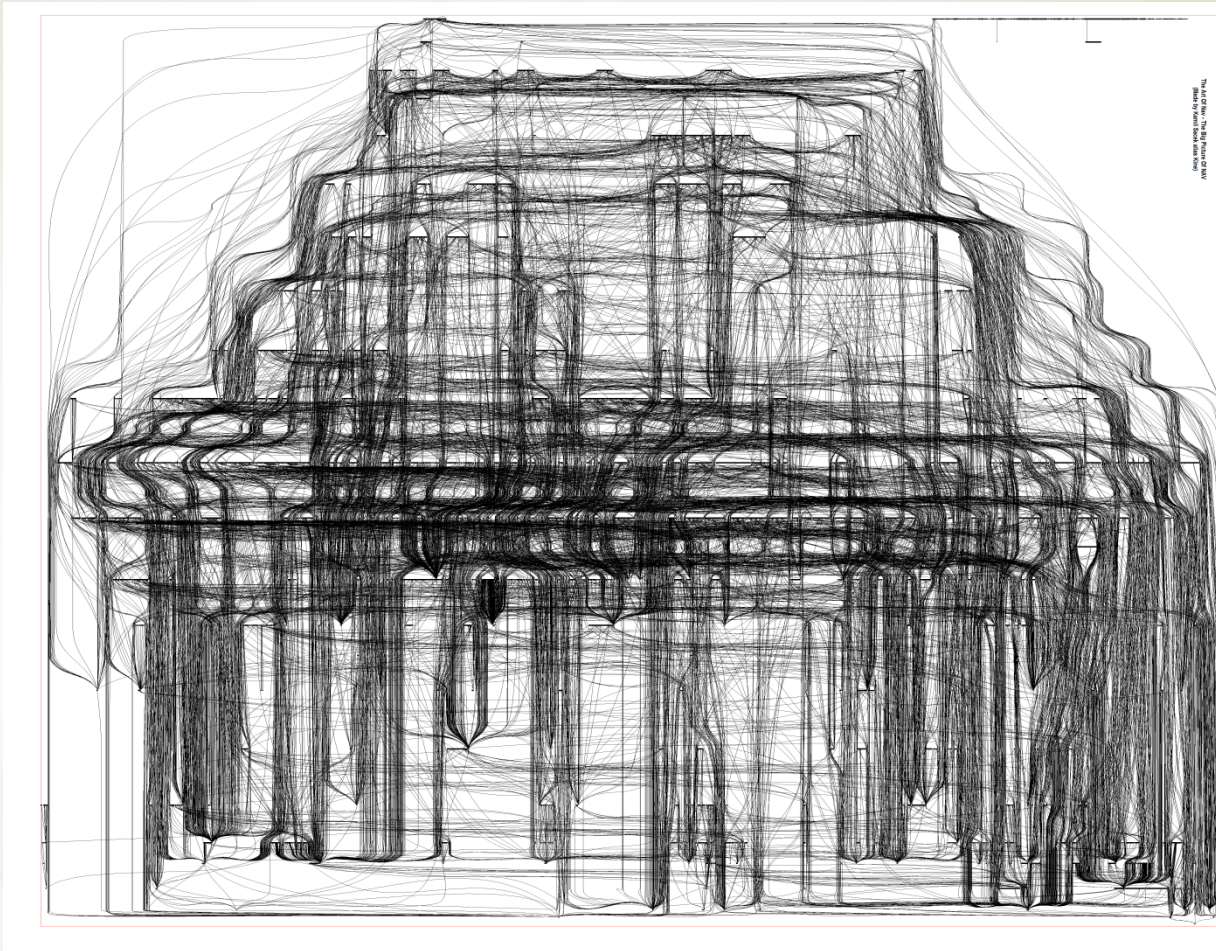
Unique architecture

Integrated Development Environment

Database

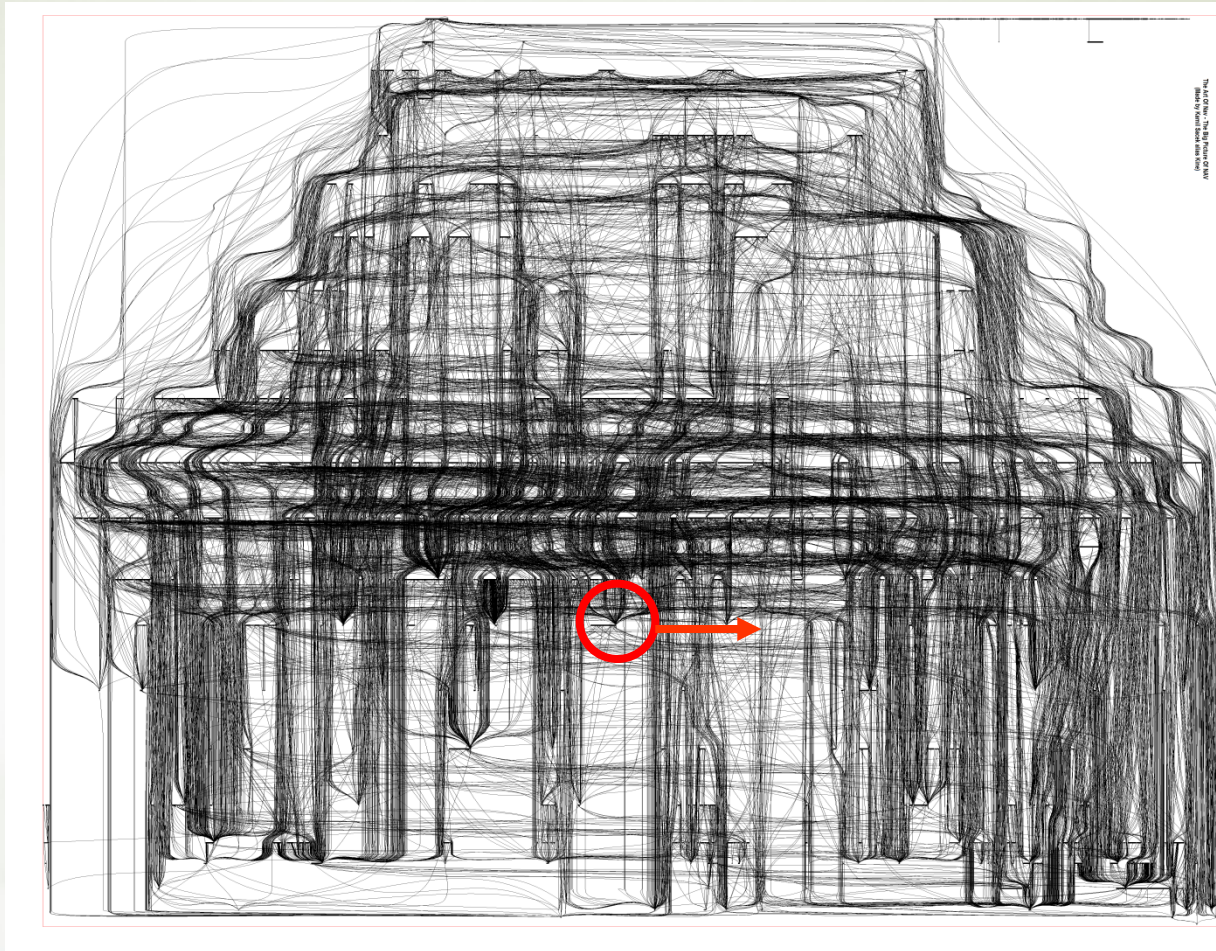


Relations among tables I



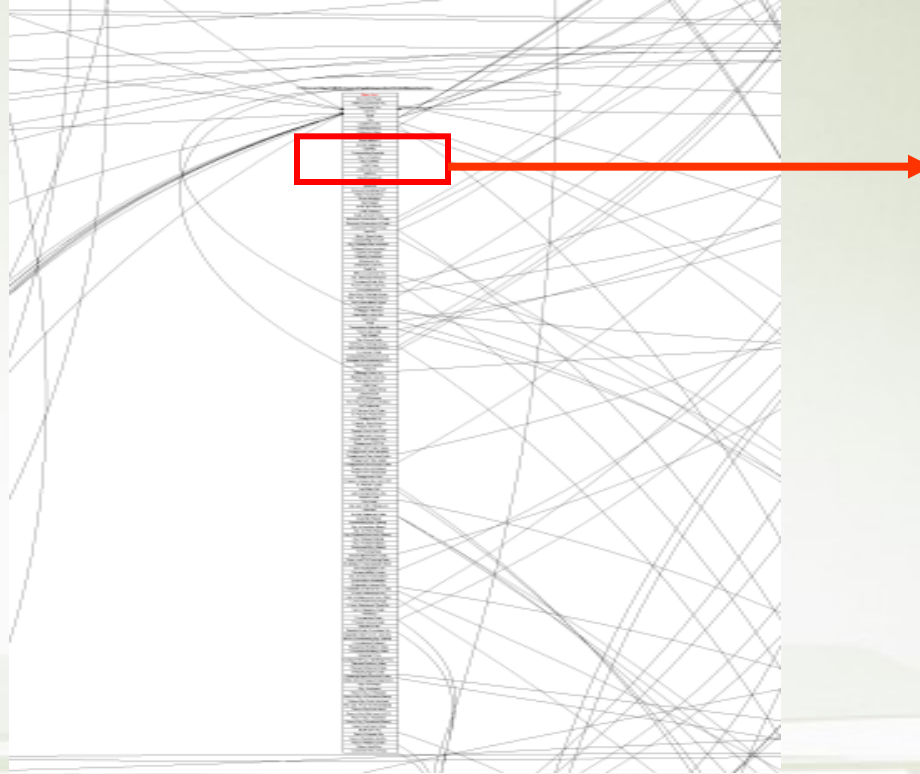
24.2.2012

Relations among tables II

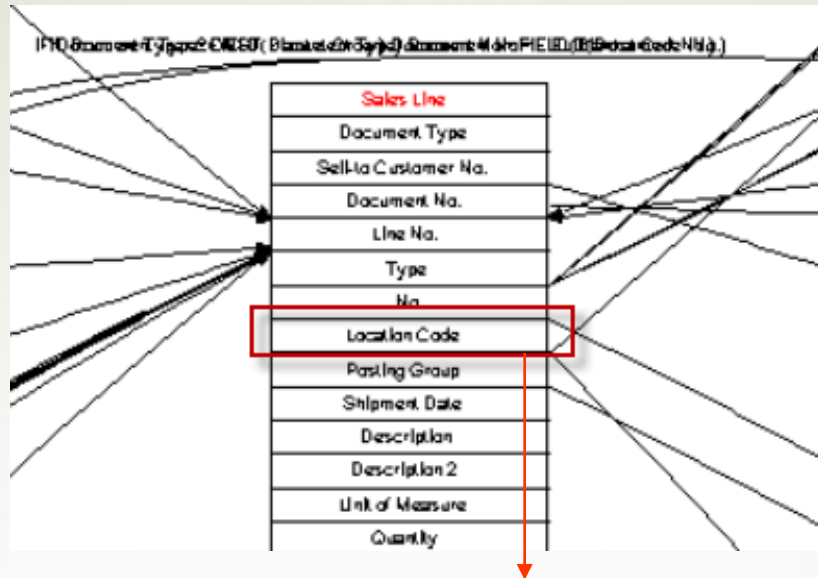


24.2.2012

One table and its relations I



One table (Sales Line) and its relations II



ERP NAV

| 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

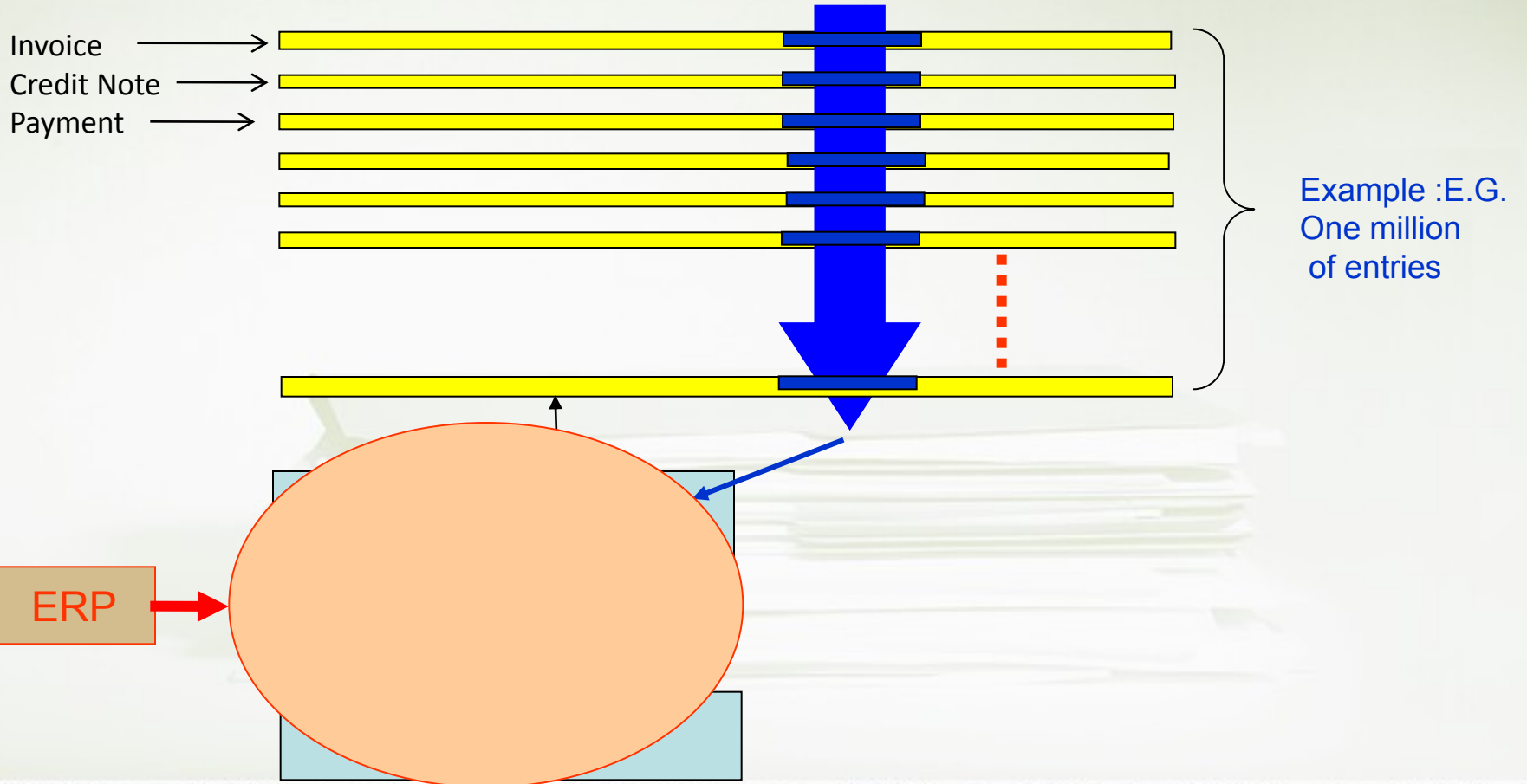
- Item Card
- Availability (8)
- Substitutions (1)
- Sales Prices (0)
- Sales Line Dis... (1)

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

Calculation field and entries (transactions related to cards- tables)

Example : Field Amount = 



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 | | | | | |
| Celkové náklady na kapac... | 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 | |
| Other services | Income Statement | | Begin-Total | Purchase | NÁRODNÍ | SLUŽBY | | |
| Cleaning | Income Statement | | Posting | Purchase | NÁRODNÍ | SLUŽBY | 992 215,91 | |
| Overhead services | 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 | | |
| Overhead services, Total | Income Statement | 518205..518295 | End-Total | | | | 2 151 014,70 | |
| Advertising | Income Statement | | Posting | Purchase | NÁRODNÍ | RŮZNÉ | 3 834 471,87 | |
| Rent and renting | Income Statement | | Begin-Total | | | | | |
| Renting of operational sp... | Income Statement | | Posting | | | | | |
| Renting of vehicles | Income Statement | | Posting | | | | | |
| Rent and renting | 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 "General" tab contains the following fields:

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

At the bottom of the window, there are four buttons: "Customer" (with a dropdown arrow), "Sales" (with a dropdown arrow), "Functions" (with a dropdown arrow), and "Help".

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

The screenshot shows a 'Customer List' window with a table of customer records. The table has the following columns: 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.

| 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 |

At the bottom of the window, there are buttons for 'OK', 'Cancel', 'Customer', 'Sales', and 'Help'. The 'Customer' and 'Sales' buttons are dropdown menus.

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

The screenshot shows a SAP Sales Order form with the following data:

| Field | Value |
|-------------------------|---------------------------|
| No. | 101018 |
| Sell-to Customer No. | 01454545 |
| Sell-to Customer Name | New Concepts Furniture |
| Sell-to Address | 705 West Peachtree Street |
| Sell-to Post Code/City | US-GA 31772 Atlanta |
| Sell-to Contact | Ms. Tammy L. McDonald |
| Posting Date | 25.01.08 |
| VAT Settlement Date | 25.01.08 |
| Order Date | 25.01.08 |
| Document Date | 25.01.08 |
| Requested Delivery Date | |
| Promised Delivery Date | |
| Quote No. | |
| External Document No. | |
| Salesperson Code | JM |
| Campaign No. | |
| Responsibility Center | |
| Status | Open |

Customer Information

- Sell-to Customer
- Ship-to Addresses (0)
- Contacts (2)
- Bill-to Customer
- Avail. Credit 0

Item Information

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

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

Partner

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 Invoicing Payments Shipping Foreign Trade

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

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 |
| US-FL 37125 | 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 |
| ✓ | 91 Post Code | Code |
| ✓ | 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> |
| TableRelation | "Post Code" |
| ValidateTableRelation | No |
| TestTableRelation | No |

Balance, Payments,..

Business Case Principles

Customer table

Sales Entry in database
(Type Invoice)

Sales Order
Header

F11

Item Chair 4 pcs 30 EURO

Item Table 1 pcs 100 EURO

Entries in General Ledger

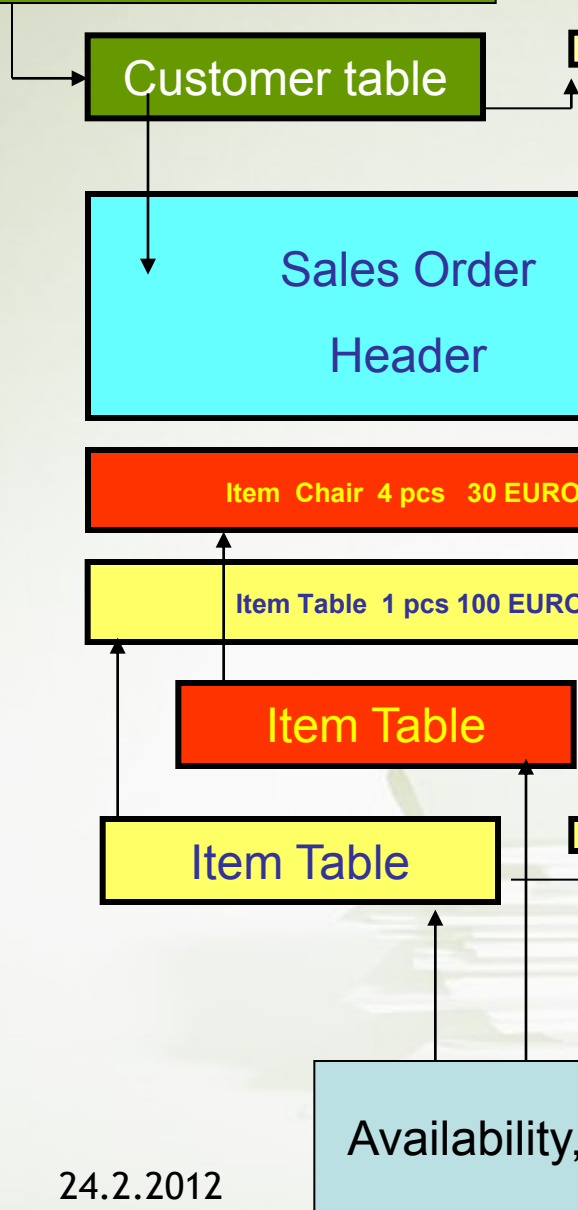
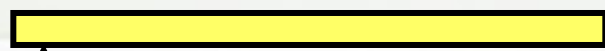
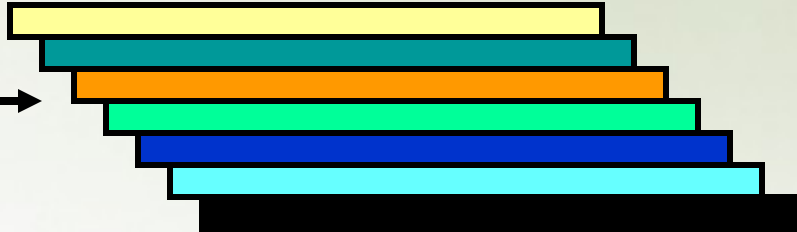
Item Table

Item Ledger Entries
in database
(Types Sales)

Item Table

Availability, Costs,...

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



Thanks for your attention



24.2.2012