



KIV/SI

Přednáška č.10

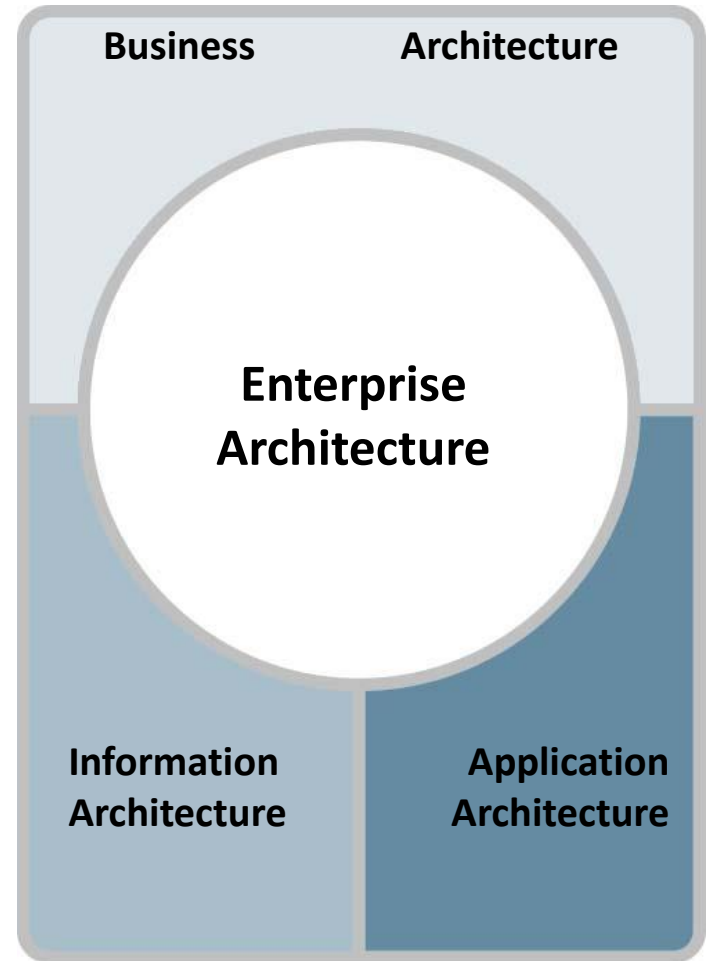
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7.5.2013

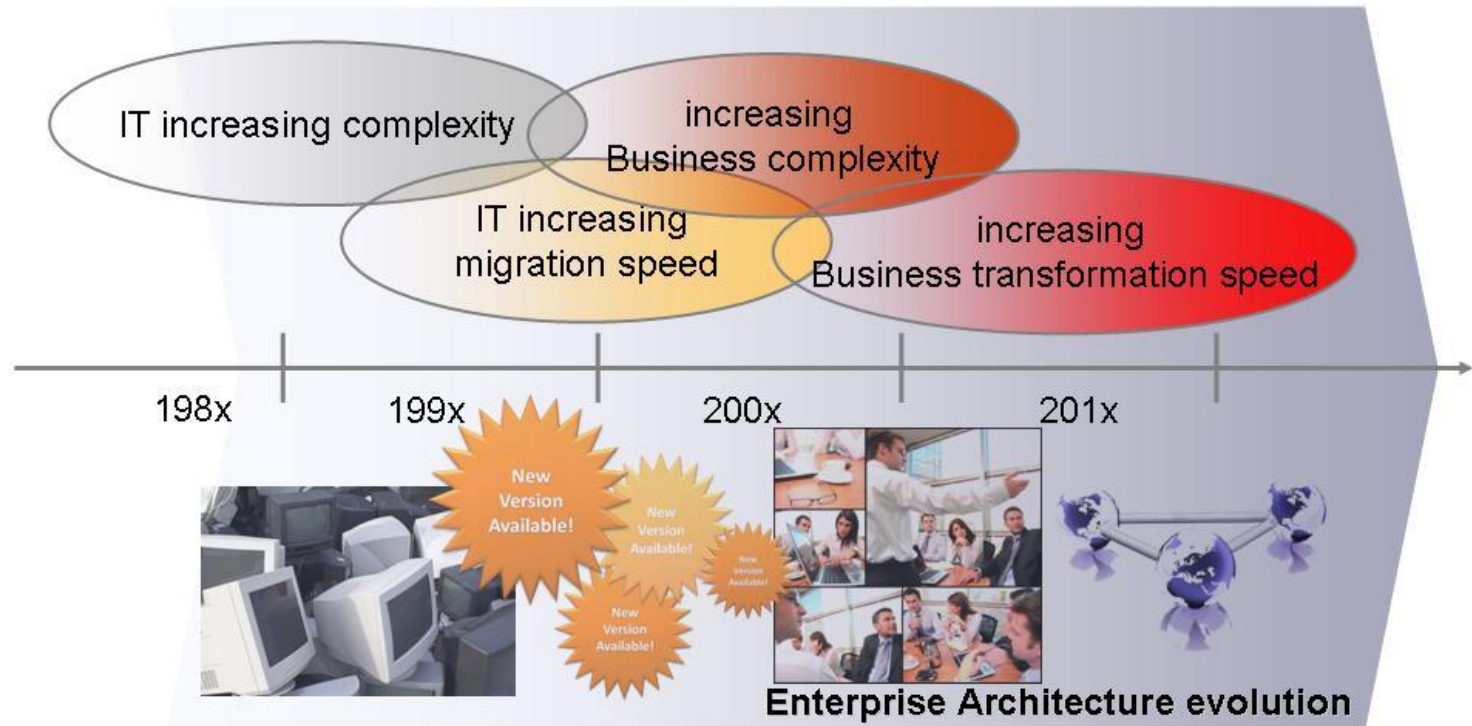
Enterprise Architecture



- EA = modelování vztahu mezi organizací, byznysem a IT; koncepčně řízený rozvoj tohoto vztahu



“Enterprise” Architecture Challenges over the ages





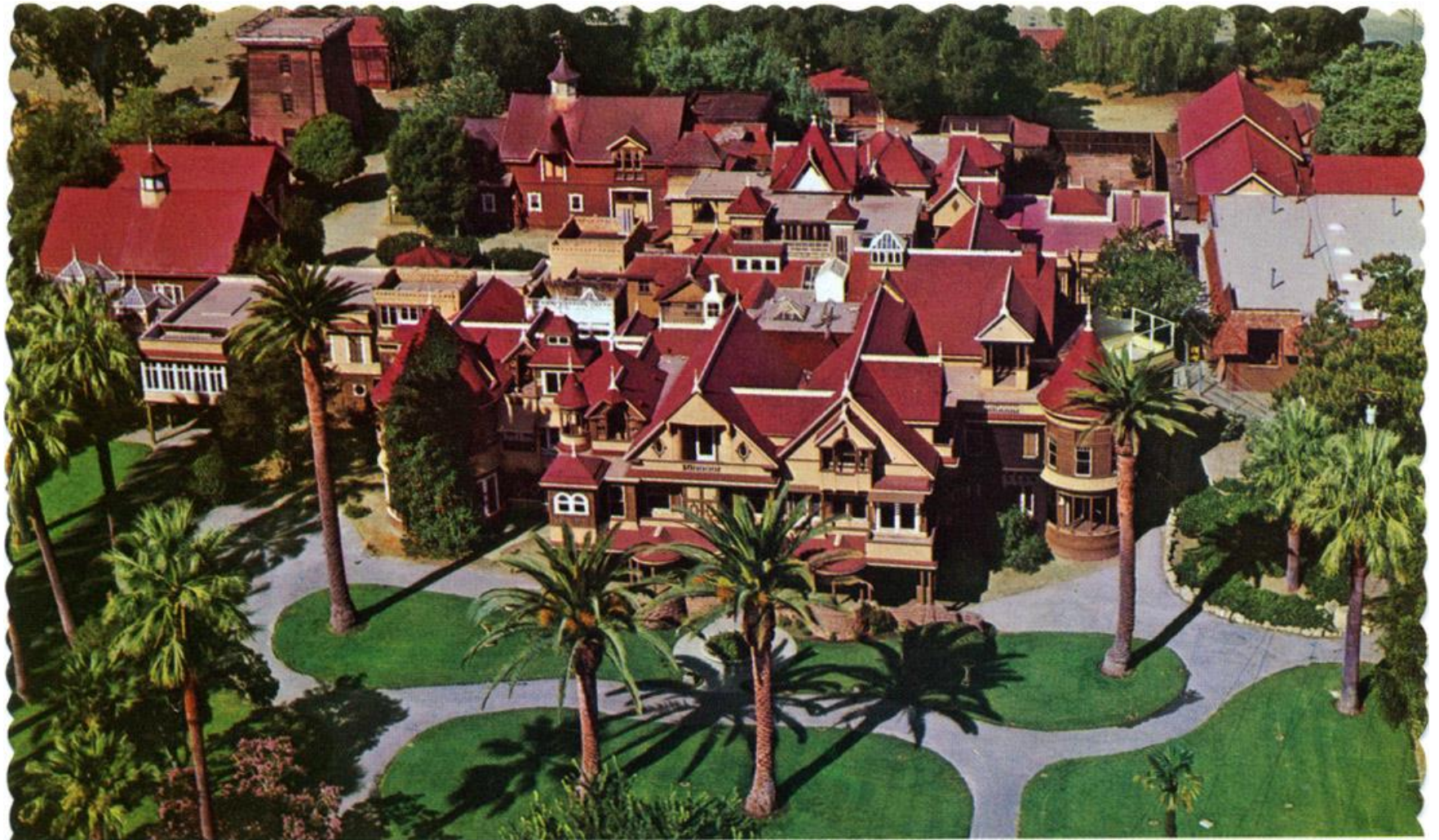
Winchester Mystery House San Jose, CA







- Some of the bizarre phenomena that gave the mansion its name:
 - A window built into the floor
 - Staircases leading to nowhere
 - A chimney that rises four floors
 - Doors that open onto blank walls
 - Upside down posts
- Sarah Winchester kept the carpenters' hammers pounding 24 hours a day for 38 years
- Blueprints available: None! Mrs. Winchester never had a master set of blueprints, but did sketch out individual rooms on paper and even tablecloths!



Winchester Mystery House

San Jose, California

- Number of rooms: 160
- Cost: \$5,500,000
- Date of Construction: 1884 - September 5, 1922 (38 years!)
- Number of stories: Prior to 1906 Earthquake - 7; presently 4
- Number of basements: 2
- Heating: Steam, forced air, fireplaces
- Number of windows: Frames 1,257; panes approx. 10,000
- Number of doors: Doorways 467, doors approx. 950 not including cabinet doors.
- Number of fireplaces: 47 (gas, wood, or coal burning)
- Number of chimneys: Presently 17 with evidence of 2 others
- Number of bedrooms: Approx. 40
- Number of kitchens: 5 or 6
- Number of staircases: 40, total of stair steps - 367
- Number of skylights: Approx. 52
- Number of ballrooms: 2 (one under construction)



1. Models help people to communicate.
 - A model describes the situation in a particular way, for a particular audience, so that other people can understand.
2. Models explain and make predictions.
 - A model relates primitive system components to one another and to complex components, providing explanation and predictions about the behavior of the system.
3. Models mediate among multiple viewpoints.
 - Two people frequently won't agree with what they want to know about a component; models represent their commonalities while allowing the differences to be explored.

- Future model to meet corporate strategic plans.
 - This is the ‘target’ state as it must evolve to reflect its strategic plan and business drivers in order to close performance gaps and take advantage of opportunities.
- Baseline model to understand where we are.
 - Capture just enough detail to model the target state and transition plans.
- Transition stages as a roadmap to the future.
 - A transition plan to model evolution stages through which the enterprise must evolve.

EA is different than system architecture

Attribute	Enterprise Architecture	Solution Architecture
Analogy	City planning	Building a house
Stakeholders	The community	The owner
Scope	Organizational	Function or solution – system or application
Detail	Low	High
Requirements	Keeps changing to close business performance gaps.	Build a product according a static requirement.
Result	Show results incrementally	Not useful until complete
Life Span	Continuous cycle without end	A project with end.
Challenge	Continuous Change	Best practice

Co je architektura?



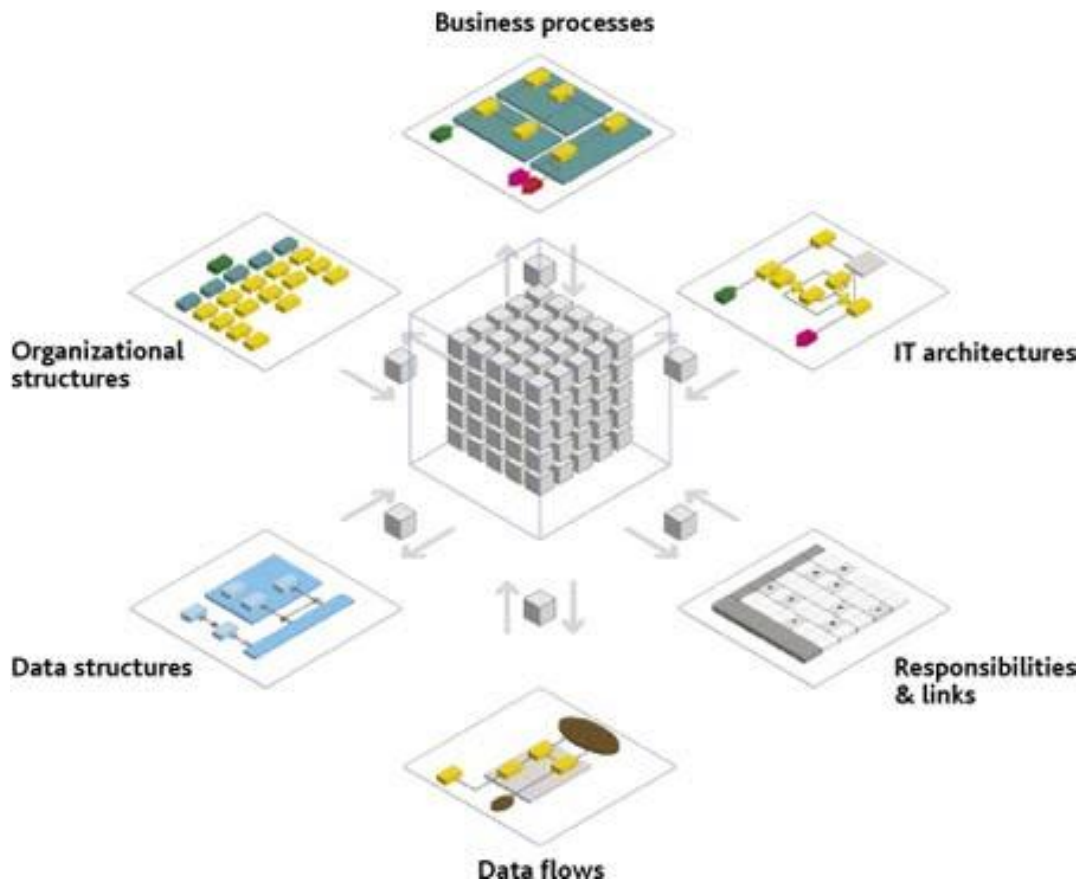
- “The art or science of building or constructing edifices of any kind for human use...”
- “The special method or ‘style’ in accordance with which the details of the structure and ornamentation of a building are arranged.”

- “The organizational structure of a system or component.”
IEEE Standard 610, “Standard Computer Dictionary: A Compilation of IEEE Standard Computer Glossaries”
- “The fundamental organization of a system embodied in its components, their relationships to each other, and to the environment, and the principles guiding its design and evolution.”
IEEE Standard 1471, “IEEE Recommended Practice for Architectural Description of Software-Intensive Systems.

- Design:
 - How each component should be build
 - OO, Class, design patterns etc'.
- Differences between architecture and design
 - Many different designs may address the same need
 - Different architectures imply different needs
- Sample from reality: House
 - Architecture: number of rooms, main structure, character, guiding lines.
 - Design: interior design, rooms structure, electricity, etc'

- Its not technical!
- Aligning IT to business.
- Answering all of the enterprise needs
- Transverse view.
- Implementation of information management
- Enforce homogeneous solutions and enable “One system” to the users.

What is Enterprise Architecture?



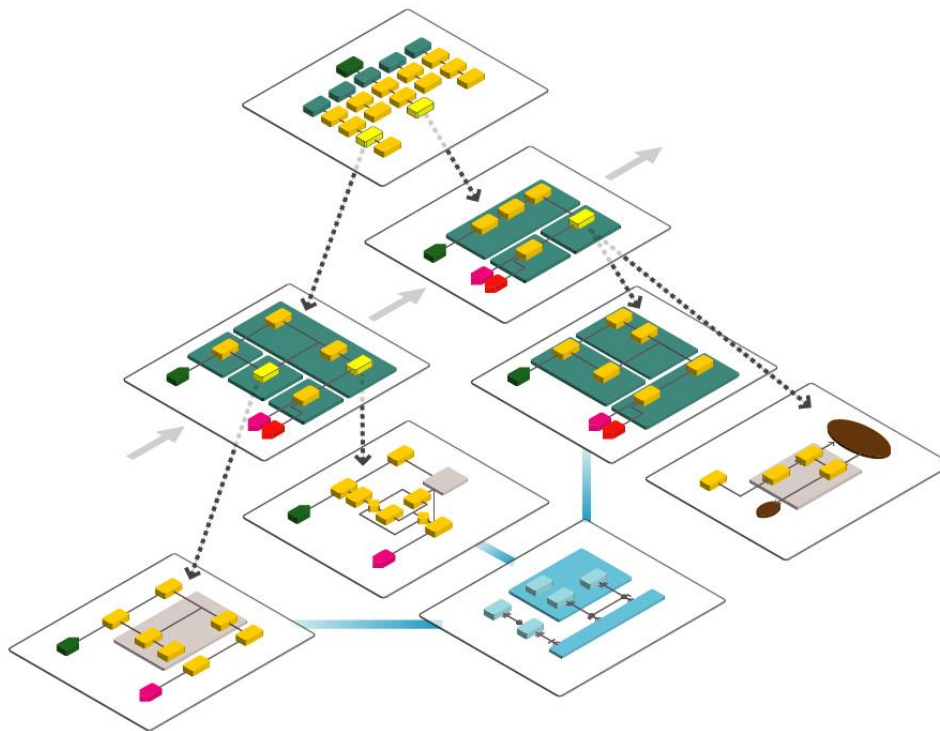
Business

Information

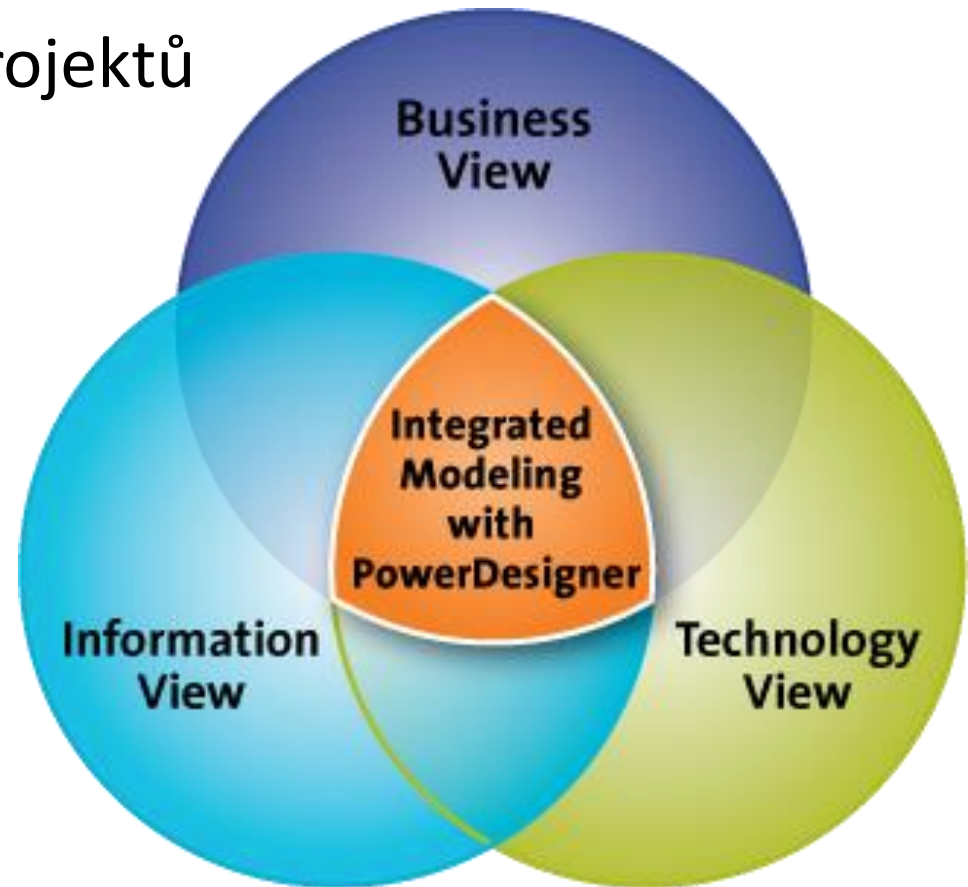
Applications

Technology

What is an Enterprise Architecture?



- Metodologie a metodiky
- Správa metadat
- Standardy
- Plánování IT, řízení projektů
- Modelování



(Sybase)

Business

Cíl – Identifikovat procesy a využití

Jak – Modelování procesů, organizačních struktur, služeb

Information

Cíl – Identifikace dat nezávisle na aplikacích a procesech

Jak – Modelování datových struktur, entit, vztahů a tabulek

Application

Cíl – Identifikace aplikací, jejich integrace a nasazení

Jak – Modelování use case, tříd, komponent, apod.

Technology

Cíl – Identifikace topologie a struktury aplikací, dat, služeb a sítí

Jak – Modelování struktur, topologií

Business

PD15

Process map, organization chart, business communication

PD12.5

Business process model, UML use case

Information

PD15

Logical modeling (editor, tools)

PD12.5

Conceptual, logical, & physical data model(s), UML-class diagram, & XML model

Application

PD15

Application architecture diagram, service-oriented diagram

PD12.5

UML behavioral diagrams, executable BP model

Technology

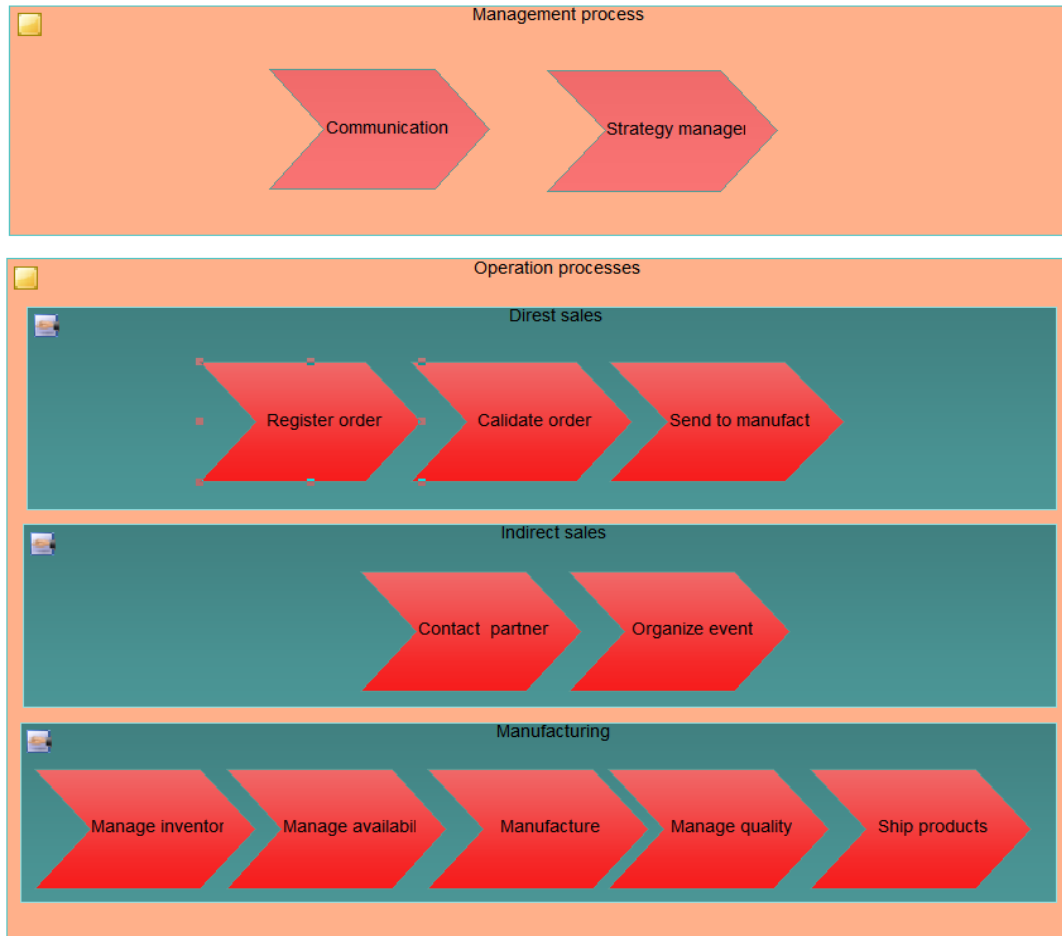
PD15

Technology infrastructure diagram

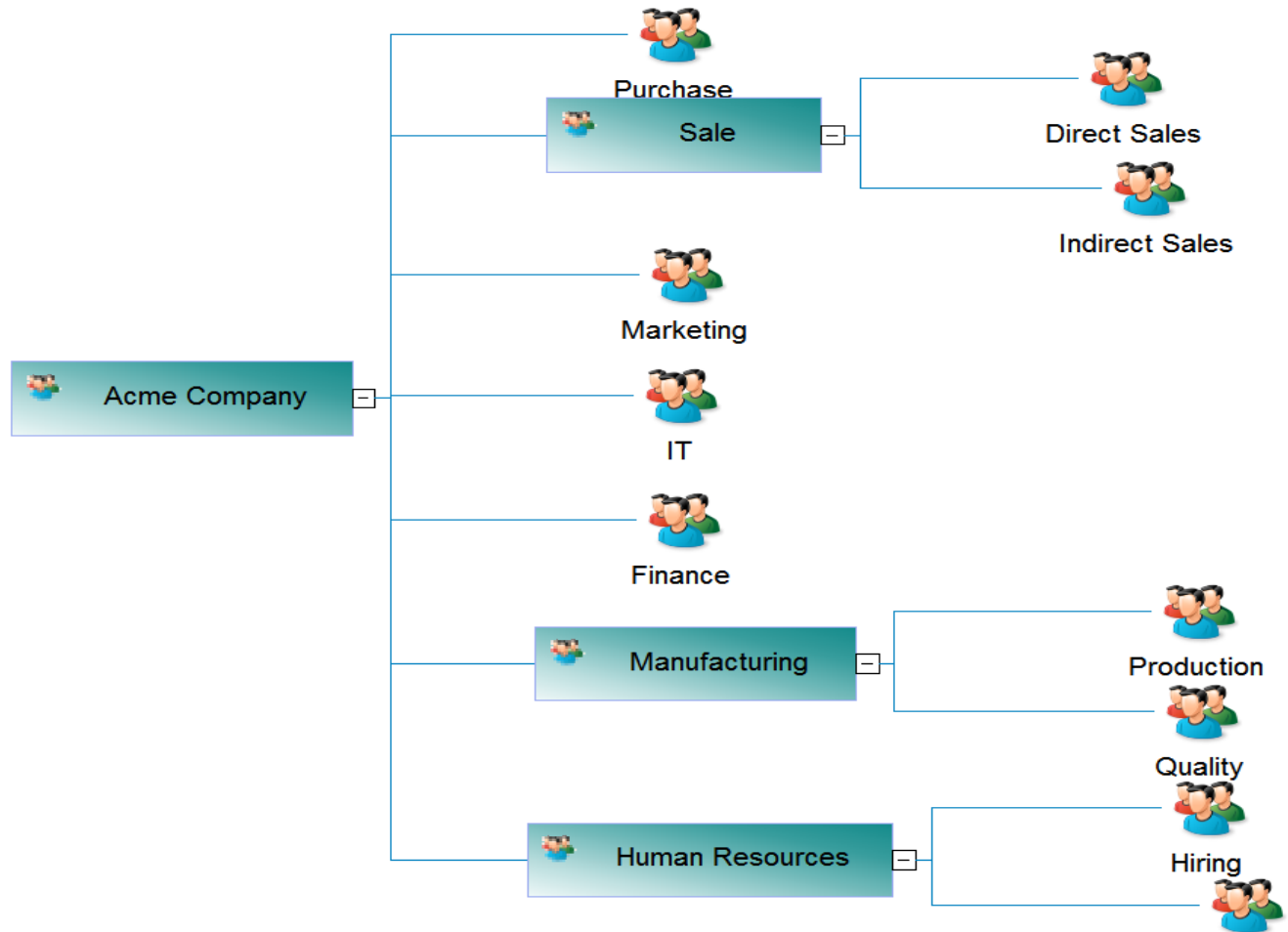
PD12.5

UML implementation diagrams

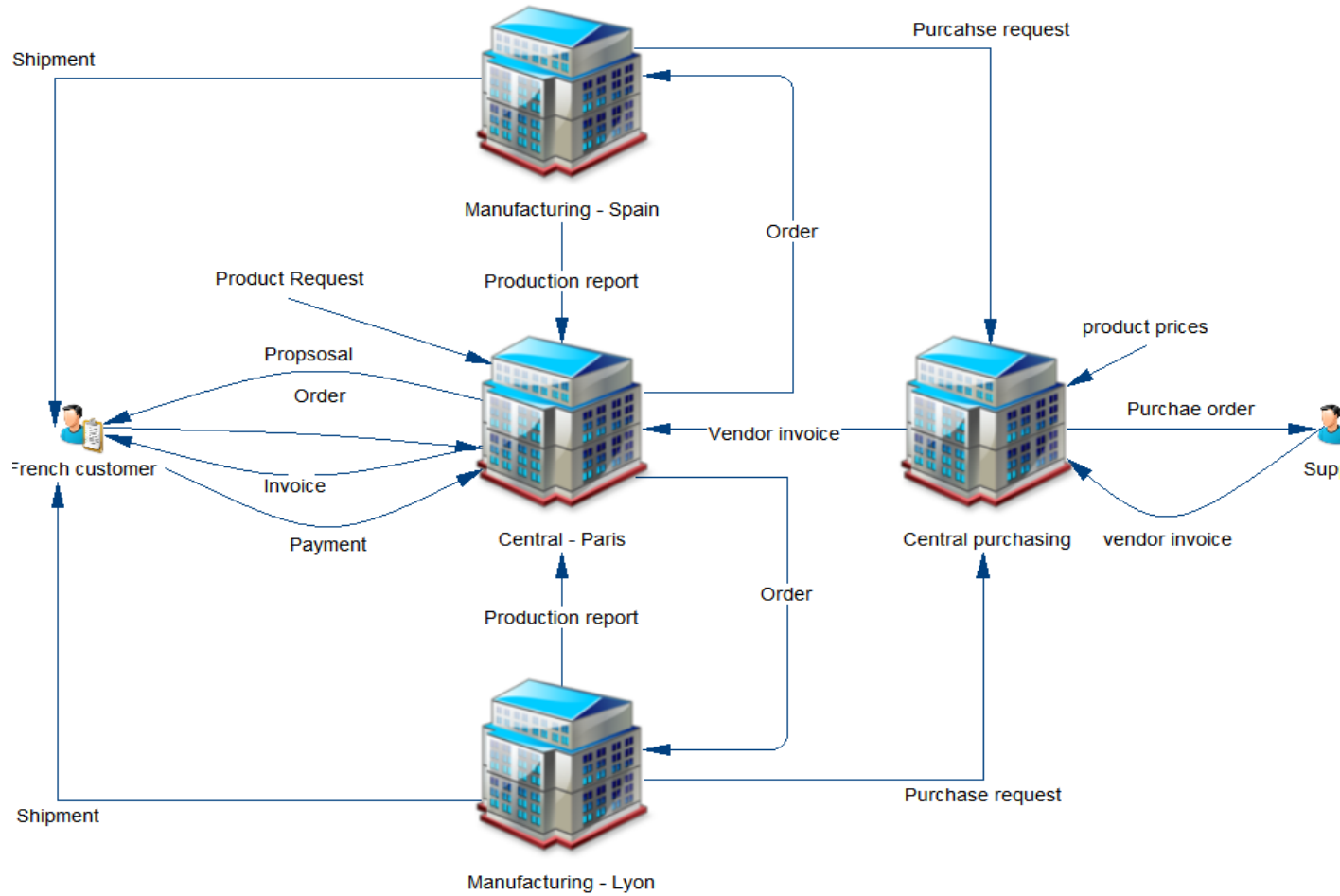
Process Map diagram



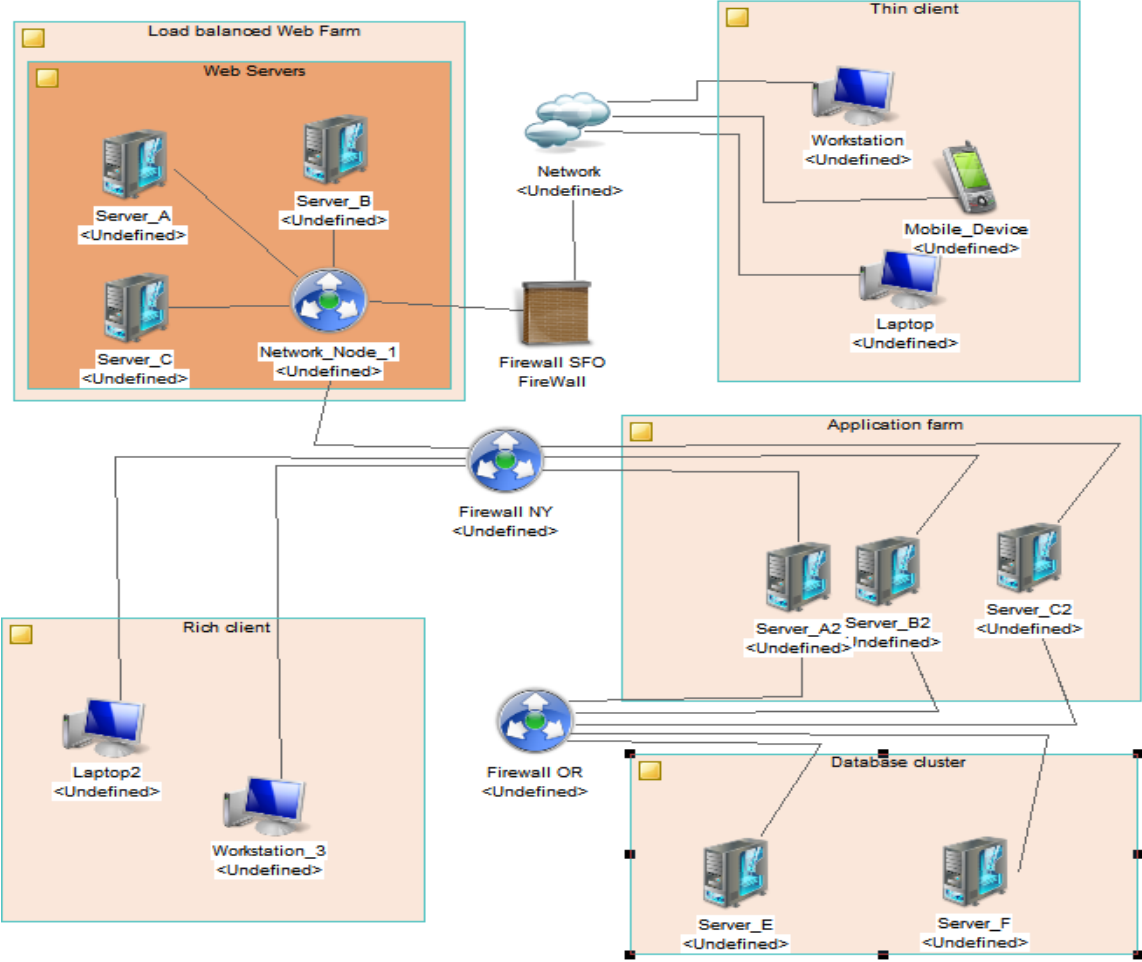
Organization chart diagram



Business Communication diagram







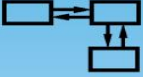


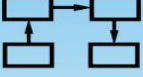







Technology Infrastructure Diagram

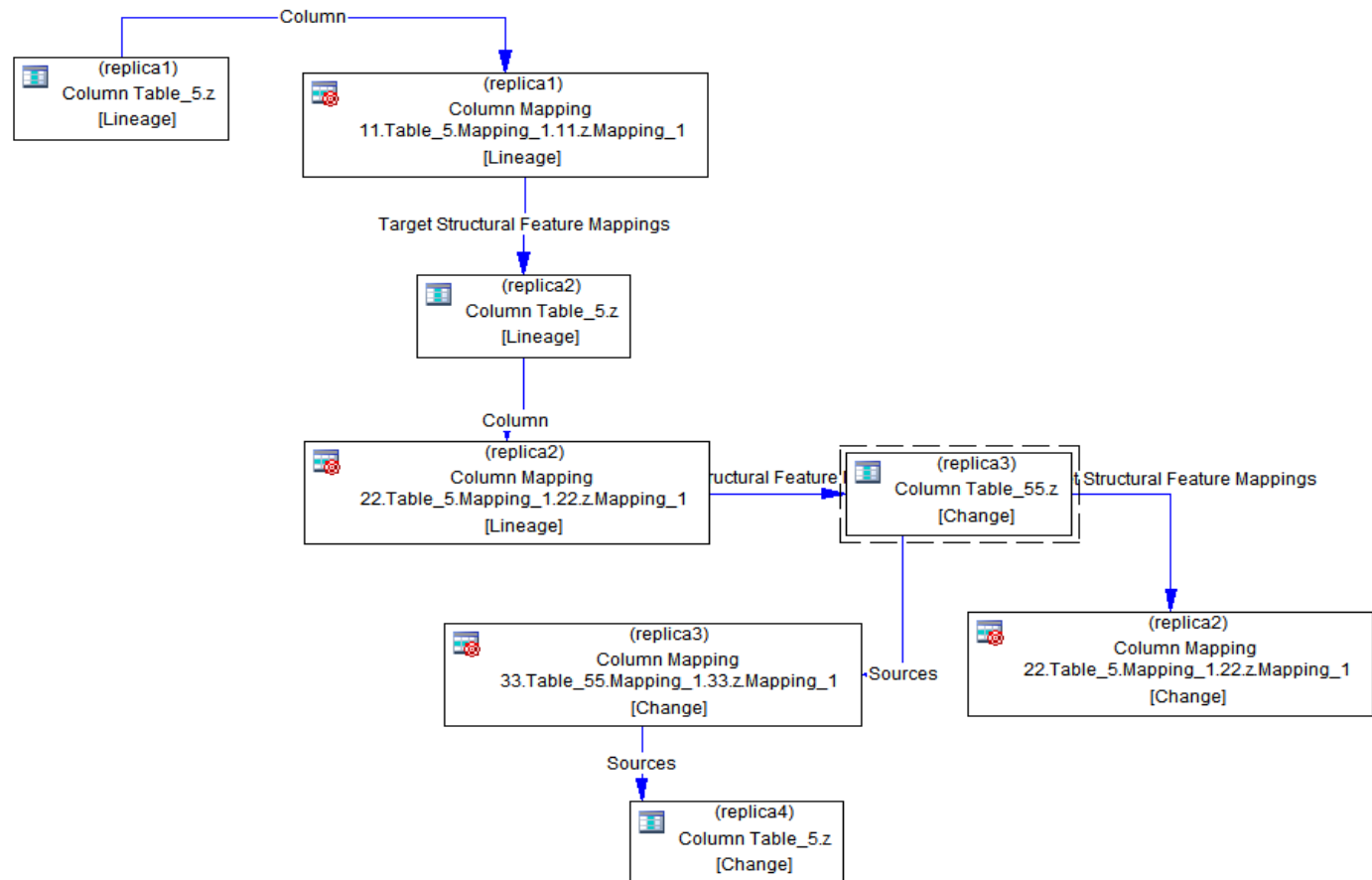


Přidělení všech potřebných modelů do jednoho „projektu“

- šablona pro metodiku FEAF
- vlastní šablona

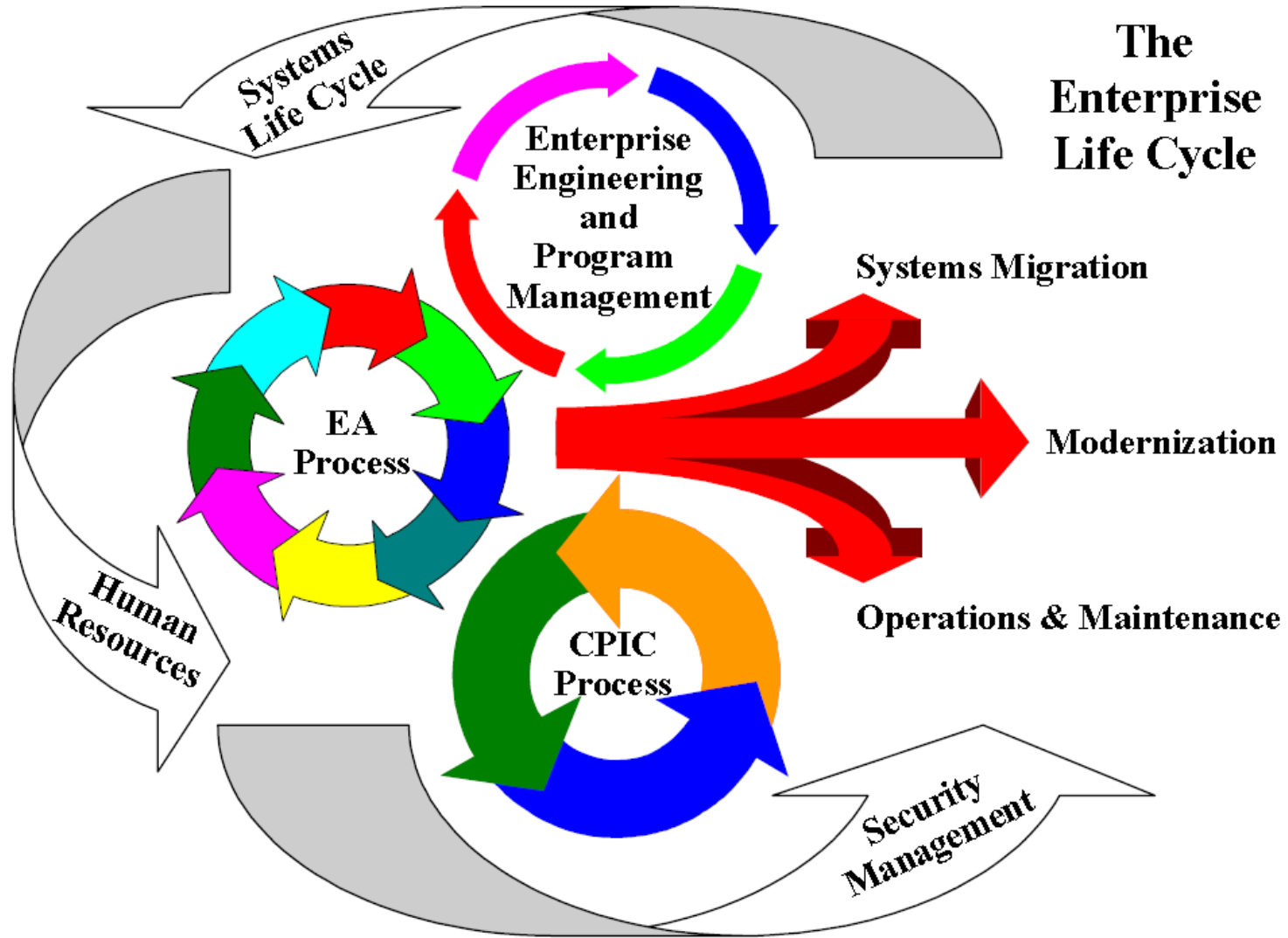
	What	How	Where
Planner's view	List of Business Objects 	List of business processes 	List of Business locations 
Owner's view	Semantic model 	Business process Model 	Business logistic system 
Designer's view	Logical data model 	Application architecture 	Deployment architecture 
Builder's view	Physical data model 	System design 	Technology architecture 
Subcontractor's view	Data directory 	Programs 	Network architecture 

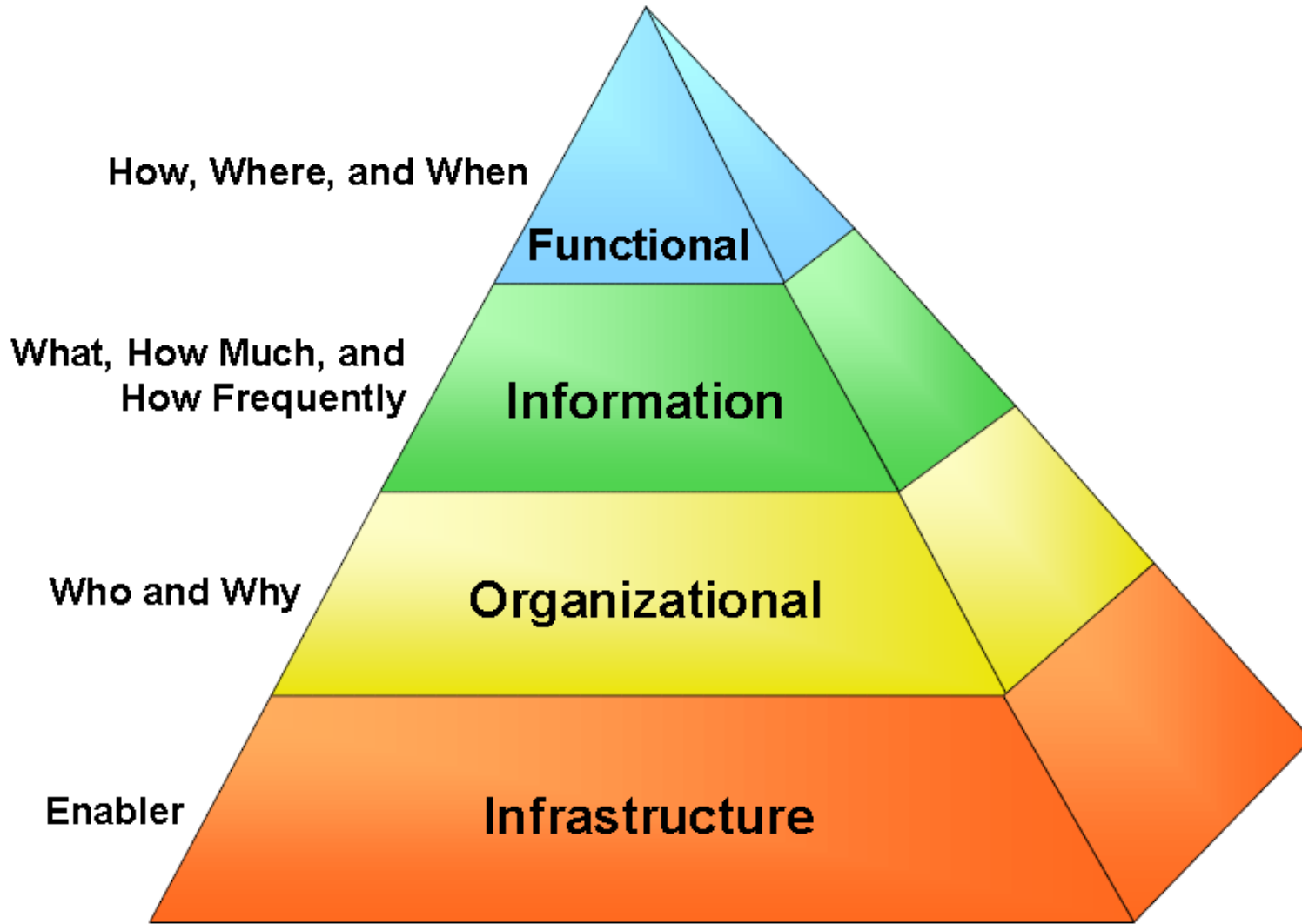
- Grafické znázornění závislostí mezi objekty
- Úprava pravidel pro analýzu



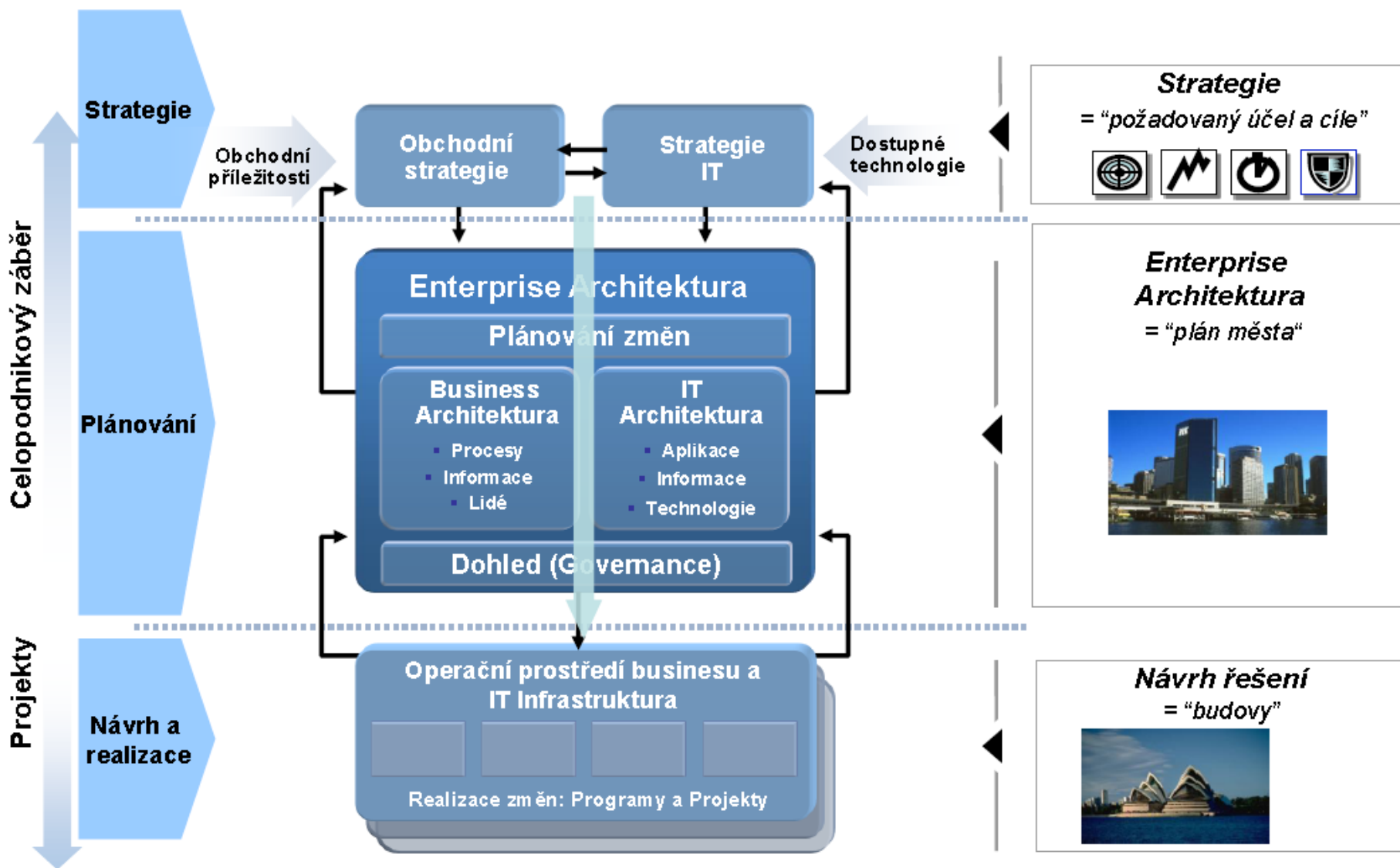
EA







Enterprise Architektura



Existuje řada způsobů pro popsání Enterprise Architektury

- **Zachmann framework** – taxonomie pro popis architektury systémů na enterprise úrovni poprvé formulována v roce 1980 Johnem Zachmannem (IBM)
- **TOGAF** (The Open Group Architecture Framework) – komplexní přístup k návrhu, plánování, implementaci a dohledu enterprise architektury
- **IBM EA Consulting Method** – metodika IBM podporující kompletní řešení enterprise architektury a poskytující standardní výstupy popisující vlastní architekturu, dohled a koordinaci na programové i projektové úrovni, dohled a koordinaci realizace změn architektury
- **Další**
 - DODAF - (US) Department of Defence Architecture Framework
 - SAP EAF - SAP Enterprise Architecture Framework (rozšíření TOGAF)
 - ...

Zachman



Zachman framework

	Why	How	What	Who	Where	When
Contextual	Goal List	Process List	Material List	Organizational Unit & Role List	Geographical Locations List	Event List
Conceptual	Goal Relationship	Process Model	Entity Relationship Model	Organizational Unit & Role Rel. Model	Locations Model	Event Model
Logical	Rules Diagram	Process Diagram	Data Model Diagram	Role relationship Diagram	Locations Diagram	Event Diagram
Physical	Rules Specification	Process Function Specification	Data Entity Specification	Role Specification	Location Specification	Event Specification
Detailed	Rules Details	Process Details	Data Details	Role Details	Location details	Event Details

- Row 1 – Scope**
External Requirements and Drivers
Business Function Modeling
- Row 2 – Enterprise Model**
Business Process Models
- Row 3 – System Model**
Logical Models
Requirements Definition
- Row 4 – Technology Model**
Physical Models
Solution Definition and Development
- Row 5 – As Built**
As Built
Deployment
- Row 6 – Functioning Enterprise**
Evaluation



	What	How	Where	Who	When	Why	
Contextual							Contextual
Conceptual							Conceptual
Logical							Logical
Physical							Physical
As Built							As Built
Functioning							Functioning
	What	How	Where	Who	When	Why	

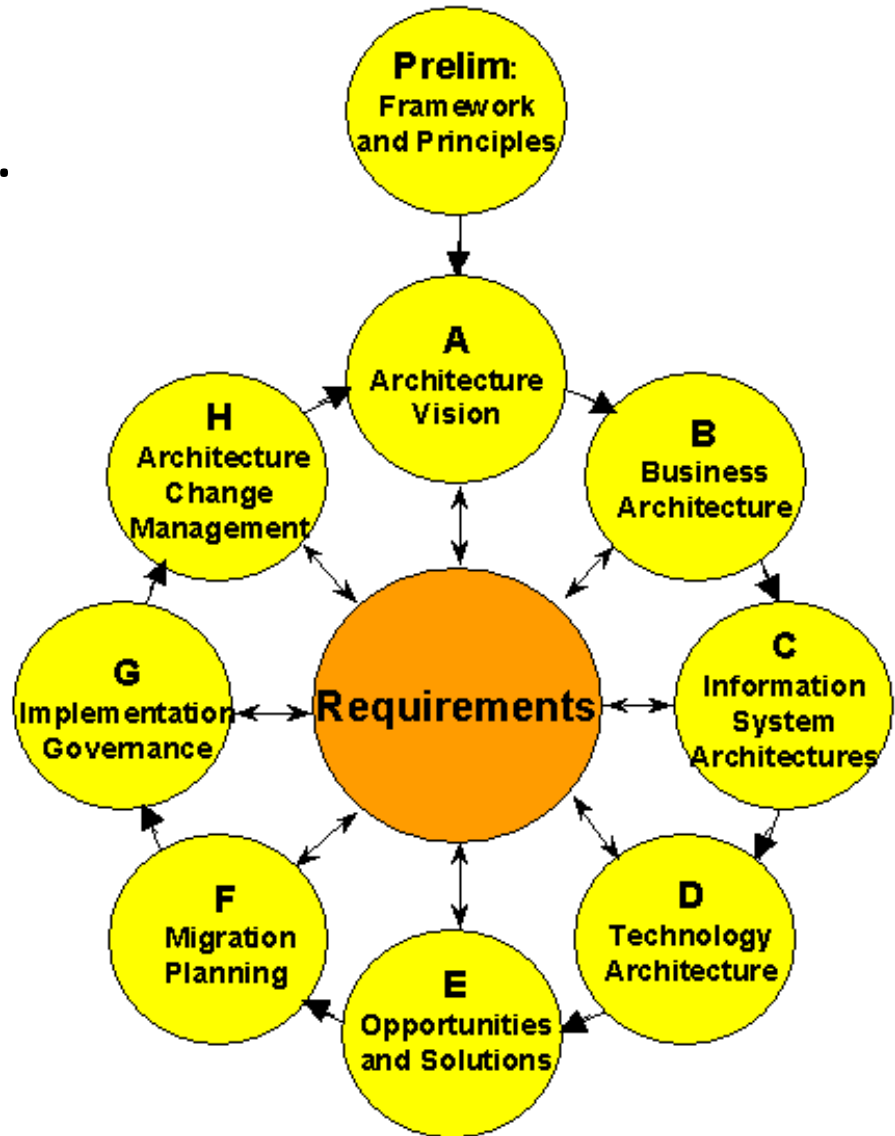
- Planner's view
 - Owner's view
 - Designer's view
 - Builder's view
 - Subcontractor's view
 - Actual system view
1. The data description — What
 2. The function descr. — How
 3. The Network descr. — Where
 4. The people description — Who
 5. The time description — When
 6. The motivation descr. — Why

TOGAF



- The Open Group Architecture Framework is a framework for EA which provides a comprehensive approach for designing, planning, implementation, and governance of an enterprise information architecture.
- TOGAF is a registered trademark of The Open Group in the United States and other countries.
- TOGAF is a high level and holistic approach to design, which is typically modeled at four levels: **Business, Application, Data, and Technology.**

- Reference model
 - How to do certain tasks.
 - Not an outcome!
- Zachman, DoDAF, TOGAF, other sector oriented.
- They're all adjustable to your needs.



Steps for each phase

A – Initiation and Framework:

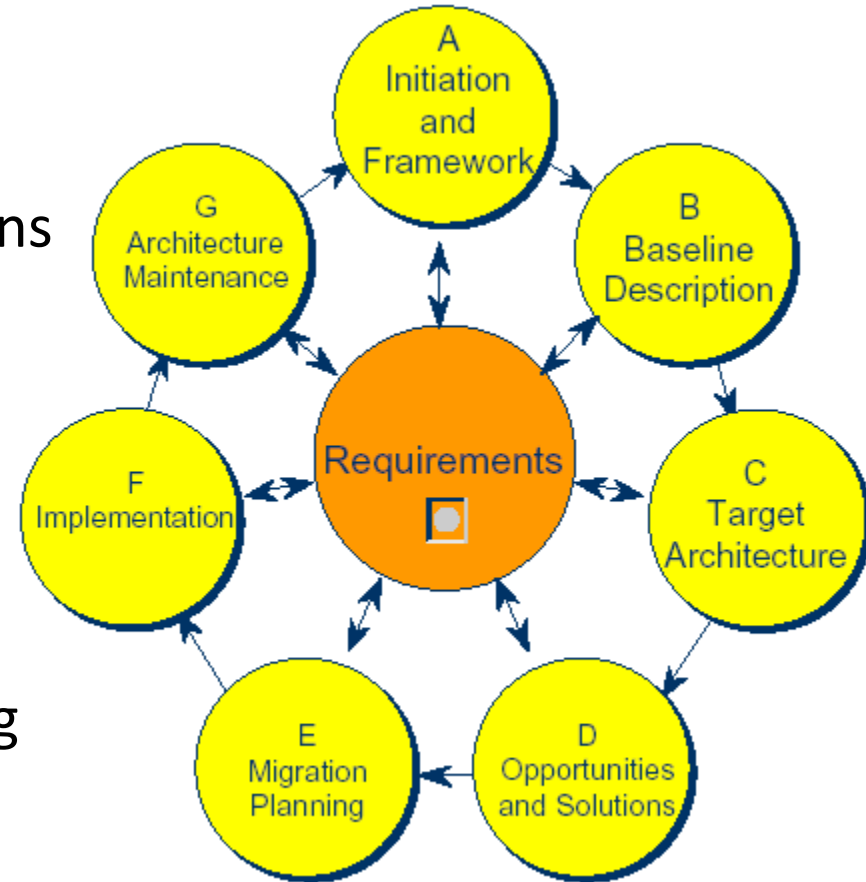
- Use Business Scenarios to define relevant business requirements
- Identify stakeholders / concerns
- Build consensus with partners

B – Baseline Description

- Build description of current system
- Identify “what’s wrong”
- Inventory of re-usable building blocks

C –Target Architecture:

- Identify all needed services
- Multiple views to address stakeholder concerns



D – Opportunities and Solutions:

- Evaluate and select major work packages

E – Migration Planning:

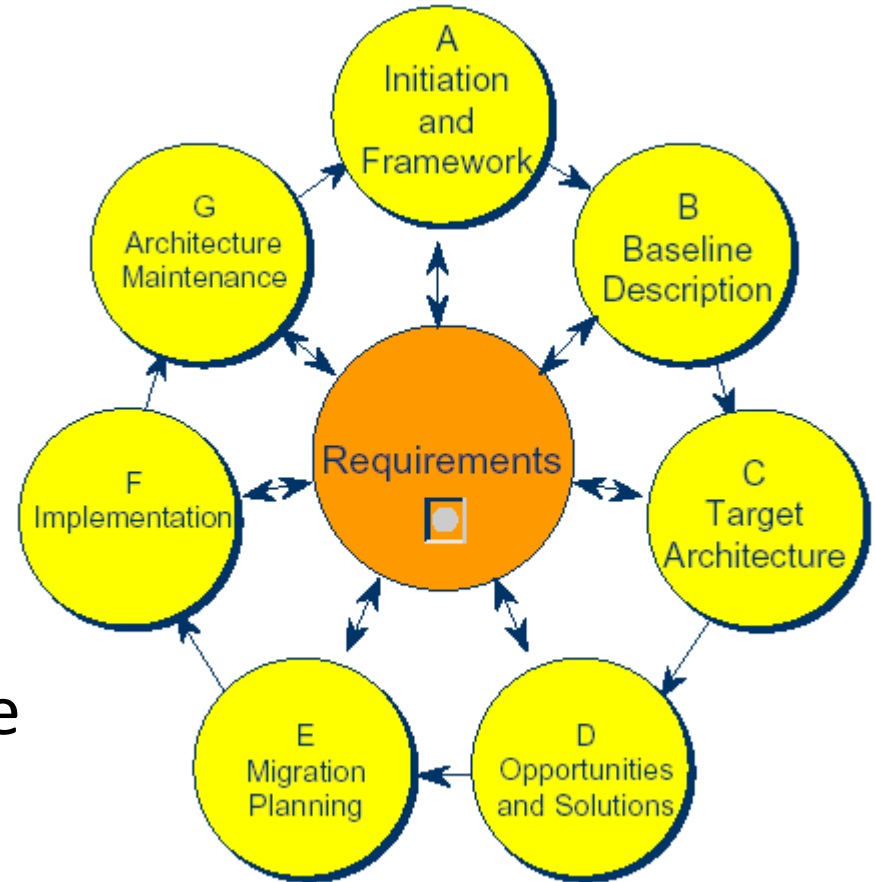
- Prioritize work
- Develop outline plan

F – Implementation:

- Develop full plan
- Execute

G – Architecture Maintenance

- Establish procedure for maintenance of new baseline

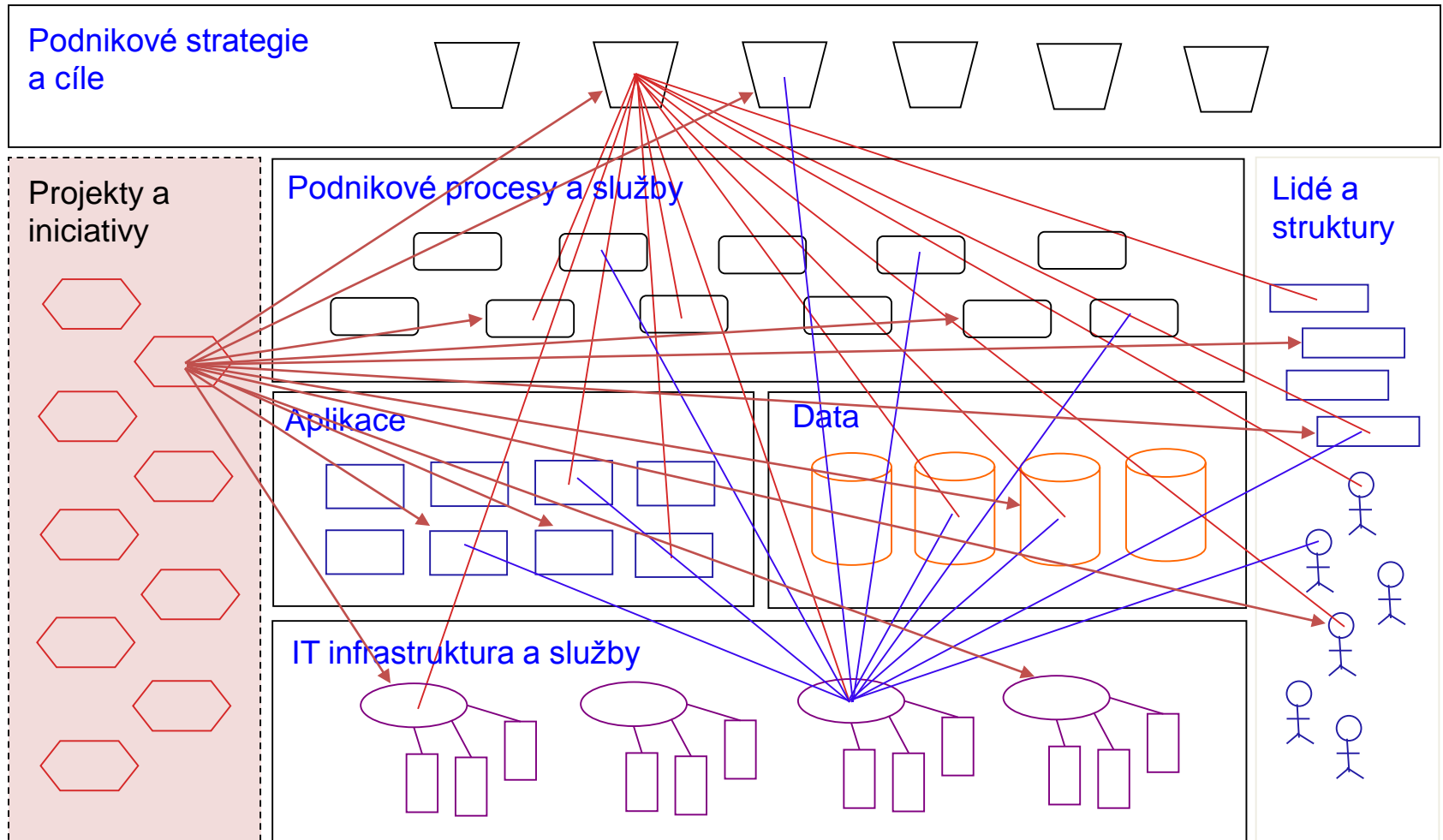


- Enterprise architecture awareness
- Implement EA vision
 - Organization commitment
 - Mapping stakeholders
- Business architecture
 - How the business works
 - BPM / BPMN / BPEN
 - Business targets
 - What are the vision and mission.
 - Gaps from current situation
 - Constraints and demands from IT

Složky EA



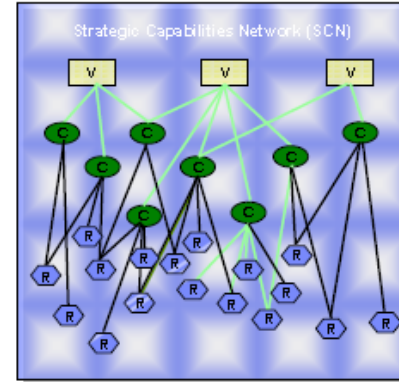
Vyladíte IT strategii s podnikovými cíly



Business Architektura

■ Strategic capabilities Network (SCN)

- Identifikace kapacit a zdrojů potřebných pro dosažení a naplnění strategických cílů



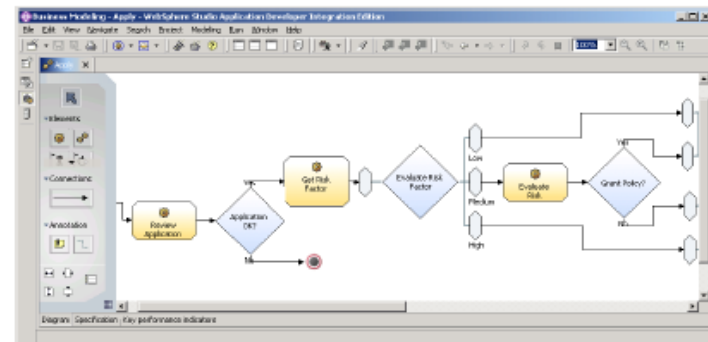
■ Komponentní model (CBM)

- Funkční model podniku
- Podnik popsán jako sada vzájemně propojených komponent
- Komponenty navrženy tak, aby byly schopné fungovat samostatně
- „Black box“ pohled – důležitá jsou rozhraní (poskytované služby, potřebné vstupy, vytvářené výstupy)

	Social Marketplace	Social Program Development	Outreach	Portfolio Management	Case Management	Collections	Compliance and Integrity	Business Services
Policy and Strategic Planning	Policy Review Compliance Case and Strategic Review	Utilization Operational Risk Policy Integration Program Oversight	Capacity Planning Inventory	Global Adverse Events		Collection Strategy Score & Case Strategy	Risk Management Policy Review Anti-Fraud	FINRA SEC ES&S IT Strategy
oversight and Accountability	External Relations Performance Management Reporting	Risk Policy Product Accountability	Capacity Administration	Asset Management Group Portfolio Management Public Management	Case Reporting Case Actual Management Case Disposition Group Portfolio Management Asset Management	Asset Management	Risk Tools RIS Compliance Anti-Fraud	FINRA SEC ES&S IT Management
Service Delivery	Market Outreach Community Support	Risk Policy Capacity Support	Program Oversight Reporting and Analysis Internal Control Mechanism	Operational Risk Asset Capacity Management Internal Control	Case Management Case Data Anti-Fraud Case Reporting Case Disposition Asset Management Internal Control	Collection Asset Management	Compliance RIS Anti-Fraud ES&S Anti-Fraud IT Strategy	FINRA SEC ES&S IT Strategy

■ Procesní model (BPM)

- Procesní model popisující základní entity a vztahy mezi nimi
- Události, aktivity, role (uživatelé) a data



Komponentní model podniku – CBM

Kompetence

- Oblasti s charakteristickými činnostmi a kompetencemi
- Například: Výroba, Product management, ...

Úrovně řízení

- Strategické řízení
- Taktické rozhodování a supervize
- Vlastní výkon činnosti

	Rízení produktové kategorie	Rízení vztahu se zákazníkem	Výroba	Sklady a distribuce	Business Admin
Direct	Produktová kategorie - tvorba strategie a plánu	Key account strategie a plán	Výrobní strategie	Strategie dodavatelského řetězce	Strategie firmy, plán
			Rízení vztahu s dodavateli		Klíčová partnerství
			Plánování výroby	Plánování zásob	Governance model
Control	Produktová kategorie - cenotvorba a controlling	Průzkum spokojenosti zákazníků	Kontrola kvality a optimalizace výrobních postupů	Kontrola distribuce	Rízení výkonnosti
	Předpověď poptávky na produktové řady	Sběr informací o zákaznících a trhu		Dodávky - řízení a kontrola	Návrh a optimalizace procesů
	Marketing a zpětná vazba	Account management	Kontrola dodavatelů	Logistika k zákazníkům	Daně, právní věci
	Tvorba/rozvoj produktů		Výroba produktů	Provoz centrálního skladu	Účetnictví
Execute	Vývoj produktů	Služby s přidanou hodnotou	Kompletace	Řízení zdrojů pro transport	Nepřímý nákup
	Testování produktů	Prodejní činnost obchodníků	Nákup pro výrobu	Řízení skladových zásob	Údržba budov
	Životní cyklus produktu				Personalistika
	Marketing - execution	Řízení skladových zásob u zákazníků			Mzdy
	Služba spotřebitelům				IT

Databáze více než 400 CBM map pro jednotlivá odvětví

Využití CBM: Identifikace prioritních oblastí pomocí „heat maps“

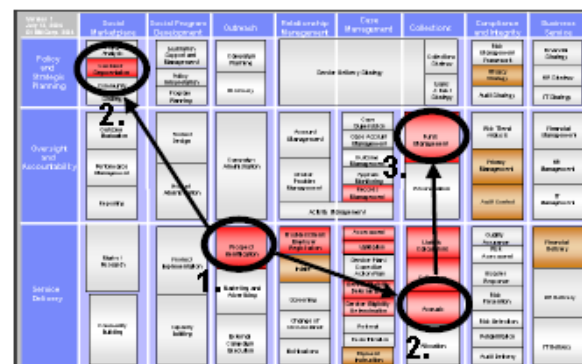
- Strategický pohled:** identifikace strategicky důležitých oblastí (vytváření hodnoty)

Strategic Pillar (Strategic Area)	Social Marketplace	Social Program Development	Outreach	Relationship Management	Case Management	Collection	Compliance and Integrity	Business Services
Policy and Strategic Planning	Public Policy, Corporate Governance, Regulatory Compliance	Customer Support, Policy Enforcement, Program Delivery	Customer Service, Security	Order Entry/Entry	Case Management, Case 2-Call Center	Collection, Case 2-Call Center	Risk Management, Compliance, Audit, Case	Service Center, IT Center, IT Center
Design and Accountability	Customer Behavior, Relationship Management, Analytics	Product Design, Product Marketing	Customer Relationship, Social Media	Case Management, Case 2-Call Center, Case Management, Case 2-Call Center, Case Management, Case 2-Call Center	Case Management, Case 2-Call Center	Collection, Case 2-Call Center	Risk Management, Compliance, Audit, Case	Service Center, IT Center, IT Center
Service Delivery	Market Research, Customer Service	Product Development, Social Campaigns	Marketing and Outreach, Social Campaigns	Case Management, Case 2-Call Center, Case Management, Case 2-Call Center, Case Management, Case 2-Call Center	Case Management, Case 2-Call Center	Collection, Case 2-Call Center	Risk Management, Compliance, Audit, Case	Service Center, IT Center, IT Center

- Výkonnost:** vyhodnocení schopnosti, nákladů, efektivity, apod.

Strategic Pillar (Strategic Area)	Social Marketplace	Social Program Development	Outreach	Relationship Management	Case Management	Collection	Compliance and Integrity	Business Services
Policy and Strategic Planning	Public Policy, Corporate Governance, Regulatory Compliance	Customer Support, Policy Enforcement, Program Delivery	Customer Service, Security	Order Entry/Entry	Case Management, Case 2-Call Center	Collection, Case 2-Call Center	Risk Management, Compliance, Audit, Case	Service Center, IT Center, IT Center
Design and Accountability	Customer Behavior, Relationship Management, Analytics	Product Design, Product Marketing	Customer Relationship, Social Media	Case Management, Case 2-Call Center, Case Management, Case 2-Call Center, Case Management, Case 2-Call Center	Case Management, Case 2-Call Center	Collection, Case 2-Call Center	Risk Management, Compliance, Audit, Case	Service Center, IT Center, IT Center
Service Delivery	Market Research, Customer Service	Product Development, Social Campaigns	Marketing and Outreach, Social Campaigns	Case Management, Case 2-Call Center, Case Management, Case 2-Call Center, Case Management, Case 2-Call Center	Case Management, Case 2-Call Center	Collection, Case 2-Call Center	Risk Management, Compliance, Audit, Case	Service Center, IT Center, IT Center

- Transformace:** Výsledná mapa slabých míst a překryvů indikuje priority pro transformaci...

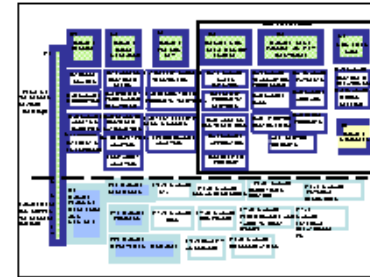


... potenciál růstu/úspor, klíčové a podpůrné činnosti firmy, sdílené nebo outsourcovatelné služby, atd.

Business Architektura – procesní modely

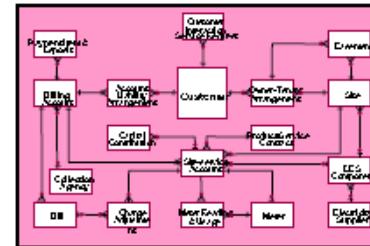
Business Activity Modeling (BAM)

- Popis procesních aktivit (procesní model podniku)
- Srozumitelný a jednoznačný popis business logiky
- Použitelný pro vyhodnocení KPI



Enterprise Information Model (EIM)

- Definuje a strukturuje informace potřebné pro podporu business aktivit podniku



Business Roles Model (BRM)

- Identifikuje role potřebné pro výkon procesních aktivit
- Specifikuje znalosti a dovednosti potřebné pro činnosti jednotlivých rolí

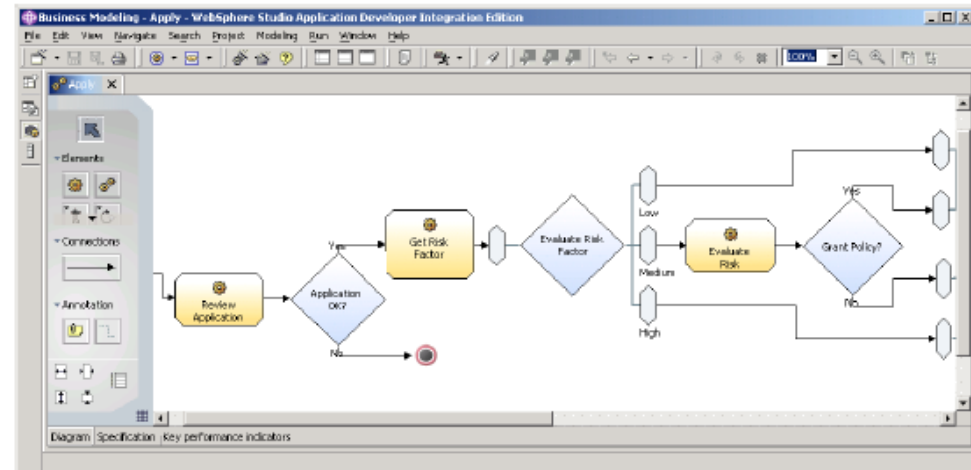
Role	Description	Jobs
Customer Representative	Provides an accessible, reliable, and efficient point of contact for the customer. Provides information, advice, and assistance to the customer. Represents the company and its products and services to the customer.	Customer Representative
Client Specialist	Provides a high level of customer service and support. Provides information, advice, and assistance to the customer. Represents the company and its products and services to the customer.	Client Specialist
Special Investigator	Investigates and reports on customer complaints and issues. Provides information, advice, and assistance to the customer. Represents the company and its products and services to the customer.	Special Investigator
Medical Staff	Works with the medical staff to provide care and support to the patient. Provides information, advice, and assistance to the patient. Represents the company and its products and services to the patient.	Medical Staff
Financial Compliance Staff	Provides financial and compliance services to the customer. Provides information, advice, and assistance to the customer. Represents the company and its products and services to the customer.	Financial Compliance Staff
Product Advisor	Provides information, advice, and assistance to the customer. Provides information, advice, and assistance to the customer. Represents the company and its products and services to the customer.	Product Advisor
Legal	Provides legal services to the customer. Provides information, advice, and assistance to the customer. Represents the company and its products and services to the customer.	Legal
Manager	Manages the business and its operations. Provides information, advice, and assistance to the customer. Represents the company and its products and services to the customer.	Manager

Analýza a optimalizace procesního modelu *Business Process Management (BPM)*

- **Analýza a optimalizace procesů**
- Snížení redundancí a rizikových míst v obchodních procesech
- Snížení manuálních činností

- **Modelování**
- Oddělení business logiky od kódu – pohled na aplikace jako na množinu poskytovaných služeb
- Simulace úprav

- **Automatizace procesů**
- Zvýšení flexibility - rychlé nasazení nových obchodních pravidel a procesů,
- KPIs pro monitorování a řízení výkonu procesů



BPM - samostatná disciplína doplňující/podporující EA

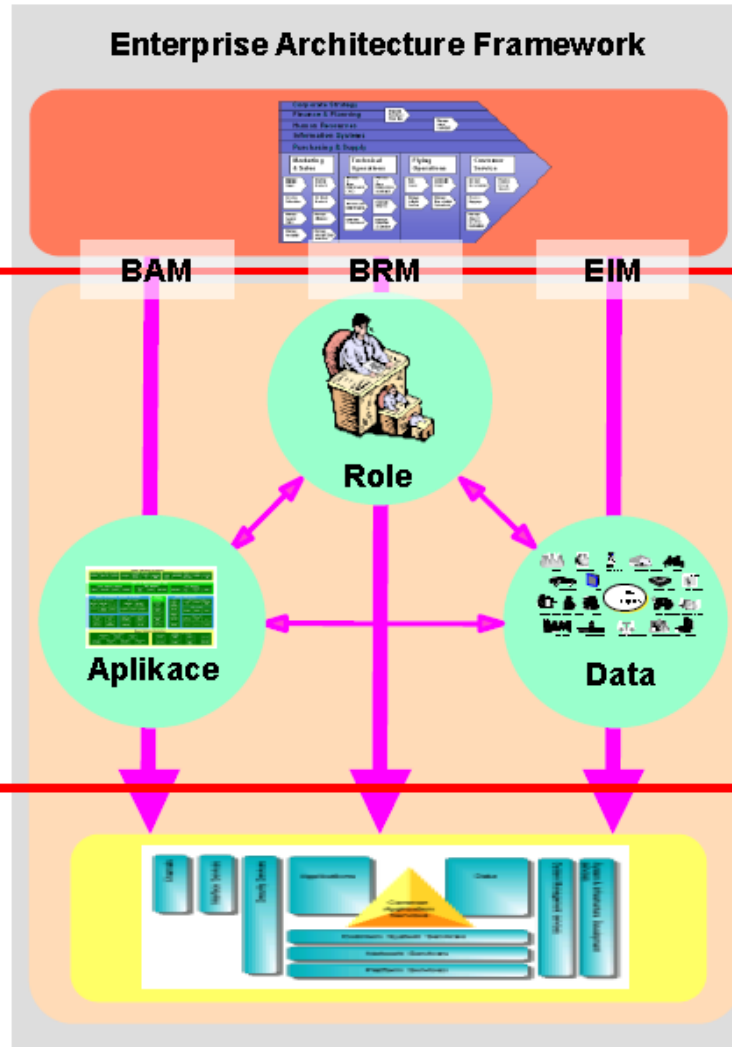
- Influence from business architecture.
- Classification enterprise information.
- How information is being managed?
- Where to store data?
- Data schemas
- How to collaborate data
- Mapping of unused / missing information
- Information availability
- Information security.

Použití výstupů Business architektury pro Architekturu IT

Business architektura

Architektura IS

Technologická architektura



- Byproduct of business and information architecture.
- Aligning systems to business needs
- Basic structure of systems
 - Architecture patterns
- Relations and communication between systems
- How systems share data

Návrh architektury IS pomocí servisně orientované architektury

V minulosti

- Zaměření na funkce
- Vyvíjeno napořád
- Delší vývojový cyklus

- Aplikační „sila“
- Úzce provázané
- Strukturování aplikací pomocí komponent a objektů



Nyní

- Zaměření na procesy
- Vyvíjeno pro podporu změn
- Implementace po přírůstcích

- Orchestrovaná řešení
- S volnými vazbami
- Strukturování aplikací pomocí služeb

- Influenced by other architectures.
- Needed infrastructure to support the systems.
- Collection of selected technologies and tools to implement chosen architectures
 - Development
 - Tools
 - Communication
 - Backups
 - Standards

- Solution
 - Mapping current situation
 - Defining the ideal situation
 - Gap analysis
 - Creating blueprints, instructions and standards to fill the gaps.
- Work plan
 - Practical definition of migration to ideal situation on time line.
 - Taking into account current situation and other constraints
- Governance
 - Governance the chosen architecture in daily work

Dohled a koordinace (Governance)



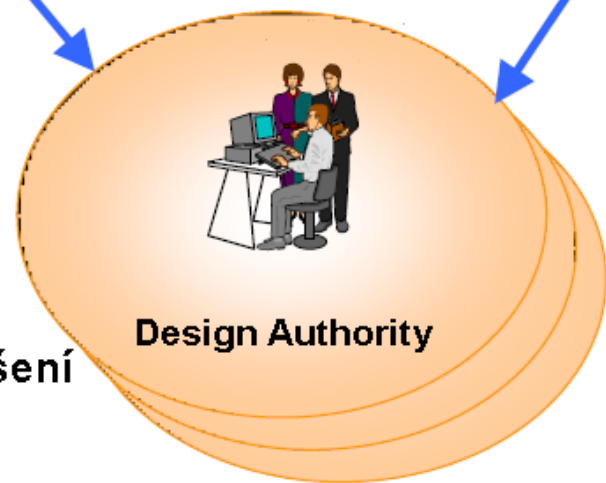
Rozhoduje

- vhodnost použitého řešení pro potřeby podniku
- potřebné změny EA
- prioritizace iniciativ



Reviduje

- kompatibilitu návrhů řešení s EA
- udržuje EA



Navrhuje

- architekturu řešení s využitím EA

