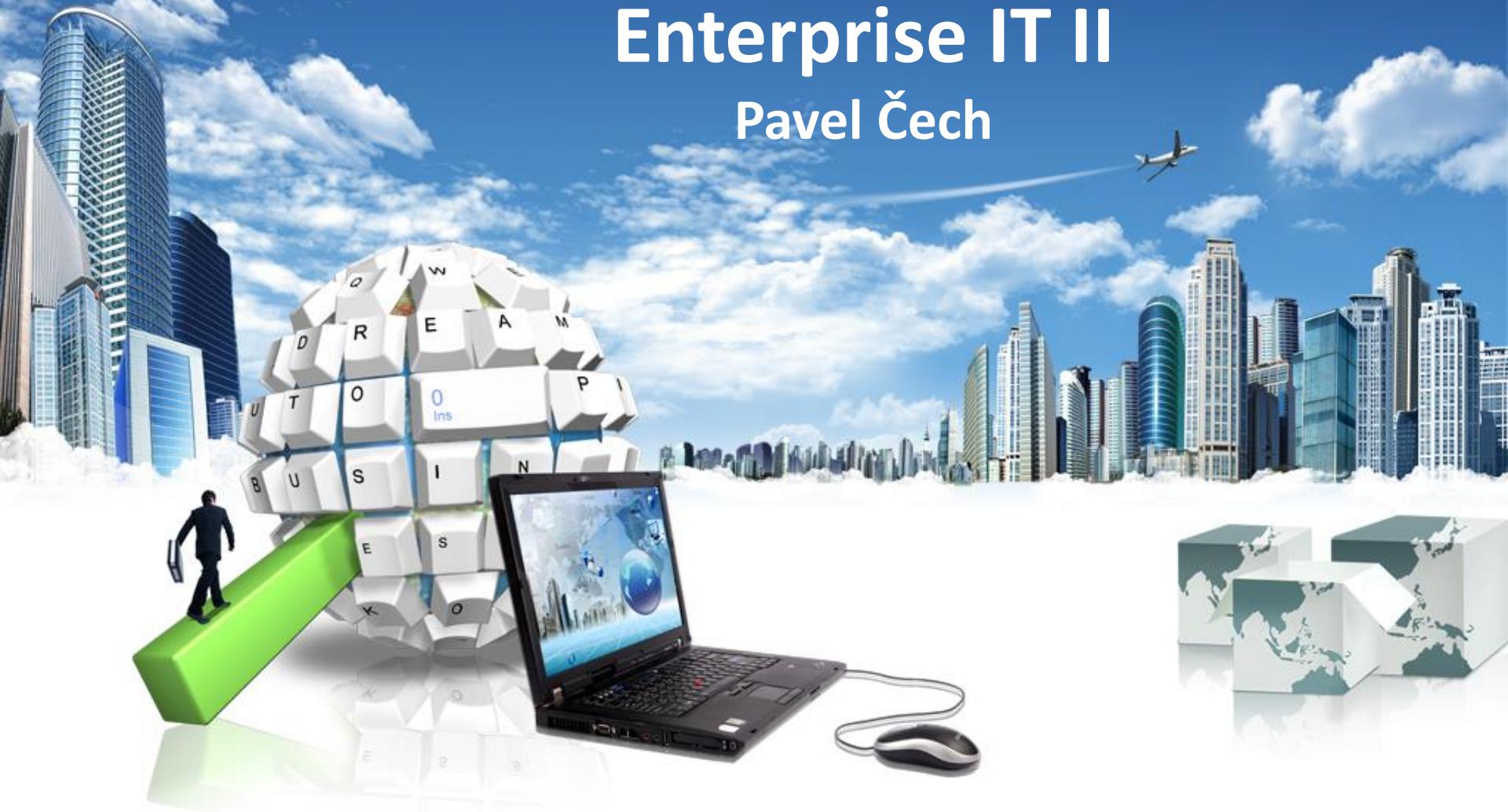


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Enterprise IT II

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Subject completion

- Activity
 - Project
 - Case studies
 - Tests
- Exam
 - Oral

Goal

- Introduction of modern approaches and best practices to IT system management
- Guidance how to optimaze the management, control and use of IT



Why is optimialiation necessary?

- Productivity paradox
- Omnipresence and dependance on IT
- Ever increasing complexity of IT
- Control over IT investments and monitoring of its returns
- Globalization forces companies to cooperate and integrate under specific standards

Case Studies

- Banka Capital One
 - 30 % decrease of system down failures
 - 92 % decrease of critical incidents during 2 years
- Anonymous Bank
 - 60 % decrease of incidents estimated savings \$ 10 mil.
- Visa
 - Implementation of Incident Management processes
 - 75 % decrease in time to cope with incident

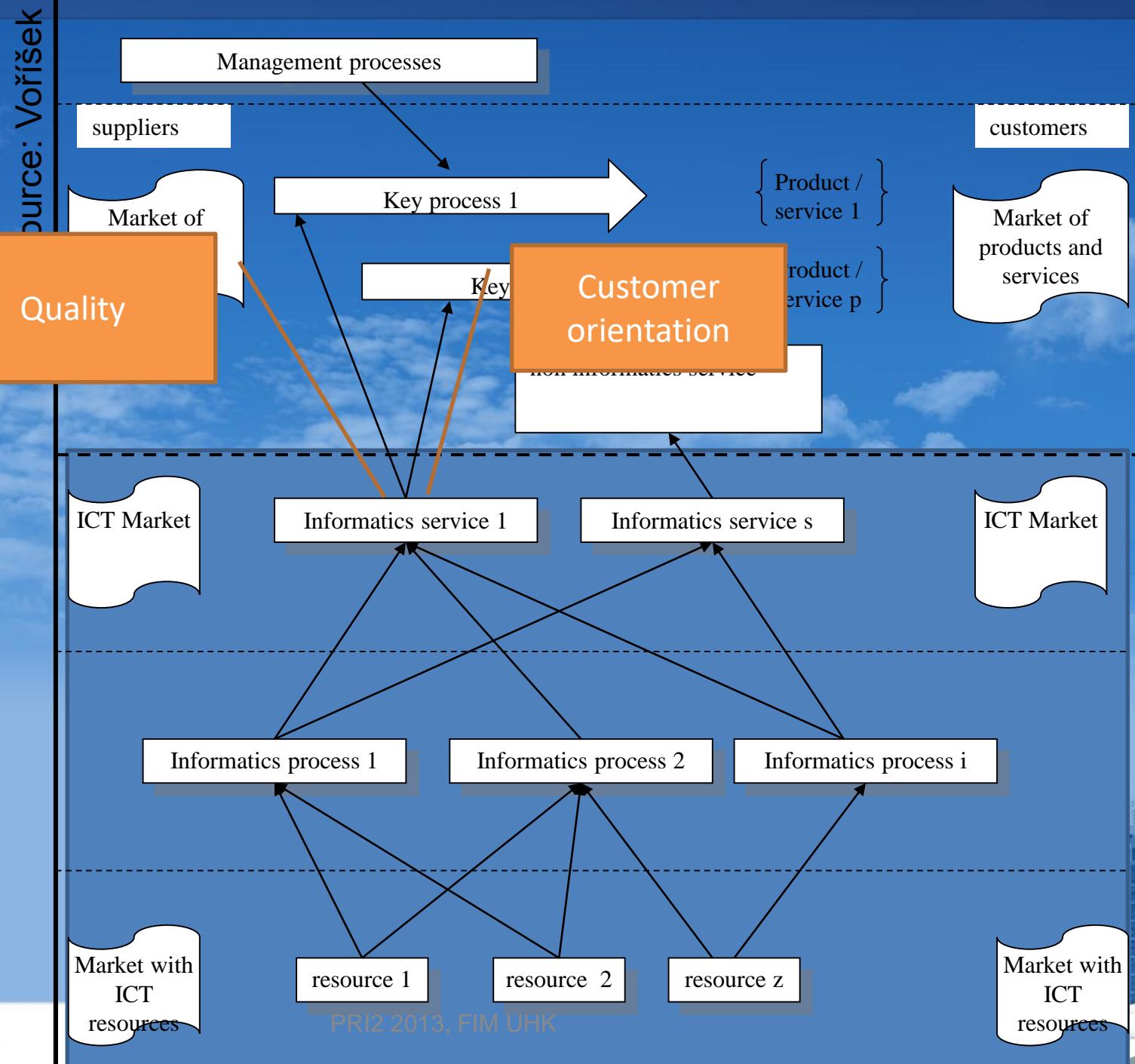


Content

- Information society and IT
- IT Service Management, IT management and IT Governance
- Frameworks in IT (ITIL, Cobit)
- Incident Management,
- Problem Management,
- Release Management
- Change Management
- Cloud Computing



Processes, services, resources



INFORMATION SOCIETY

Questions

- How we can say that a society is information one?
- What will be next after information society?
- What are the negative effects of information society?
- How governments support information society?
- What are the opportunities for businesses?



Information society

- „society, in which the quality of life and the prosperity of social and economic development depend on information and its usage “ (Vodáček 1997).
- „society with a wide usage of information and communication technologies and a high rate of digitalization “ (Froulík 2005)



Charakteristics of IS

- Information becomes a valuable economic resource
- Economic maturity is measured by the share of services on GDP and other indices
- The major forces behind the economic growth and development is represented by ICT
- ICT provides easy access to information and is ubiquitous and pervasive throughout the whole society and human activity



Digital economy

- There is a demand and supply of digital products and services
- Physical products are enriched with chips and possible connection to a network infrastructure
- Network infrastructure connects most of the subjects
- There is a development of e-activities (e-business, e-government, etc.)



Trends in IS

- Individual perspective
 - From isolation to integration
 - From local citizens to virtual communities
 - From consumer to „prosumer“
- Social perspective
 - From government to people
 - From resource scarcity to sustainable development
 - From local markets to global virtual market



Trends in businesses

- Customer orientation and personalization of the production
- Pressure to increase productivity by exploiting ICT
- Towards the digital economy
- Service orientation rather than product orientation



IT GOVERNANCE

Key questions in IT Governance

- What decisions must be made to ensure effective management and use of IT?
- Who should make these decisions?
- How will these decisions be made and monitored?



IT Governance

„Specifying the decision rights and accountability framework to encourage desirable behaviour in the use of IT.“ (ISACA)

- Continously coordinated set of rules and agreements that state decisions rights and responsibilities about IT
- Declares who and how can make decisions about IT together with monitoring the return on investments



Why IT Governance

- Good IT Governance Pays Off
- IT is expensive
- IT is pervasive
- New IT bombard Enterprises with new opportunities
- IT value depends on more than just a good technology
- Senior management has a limited bandwidth

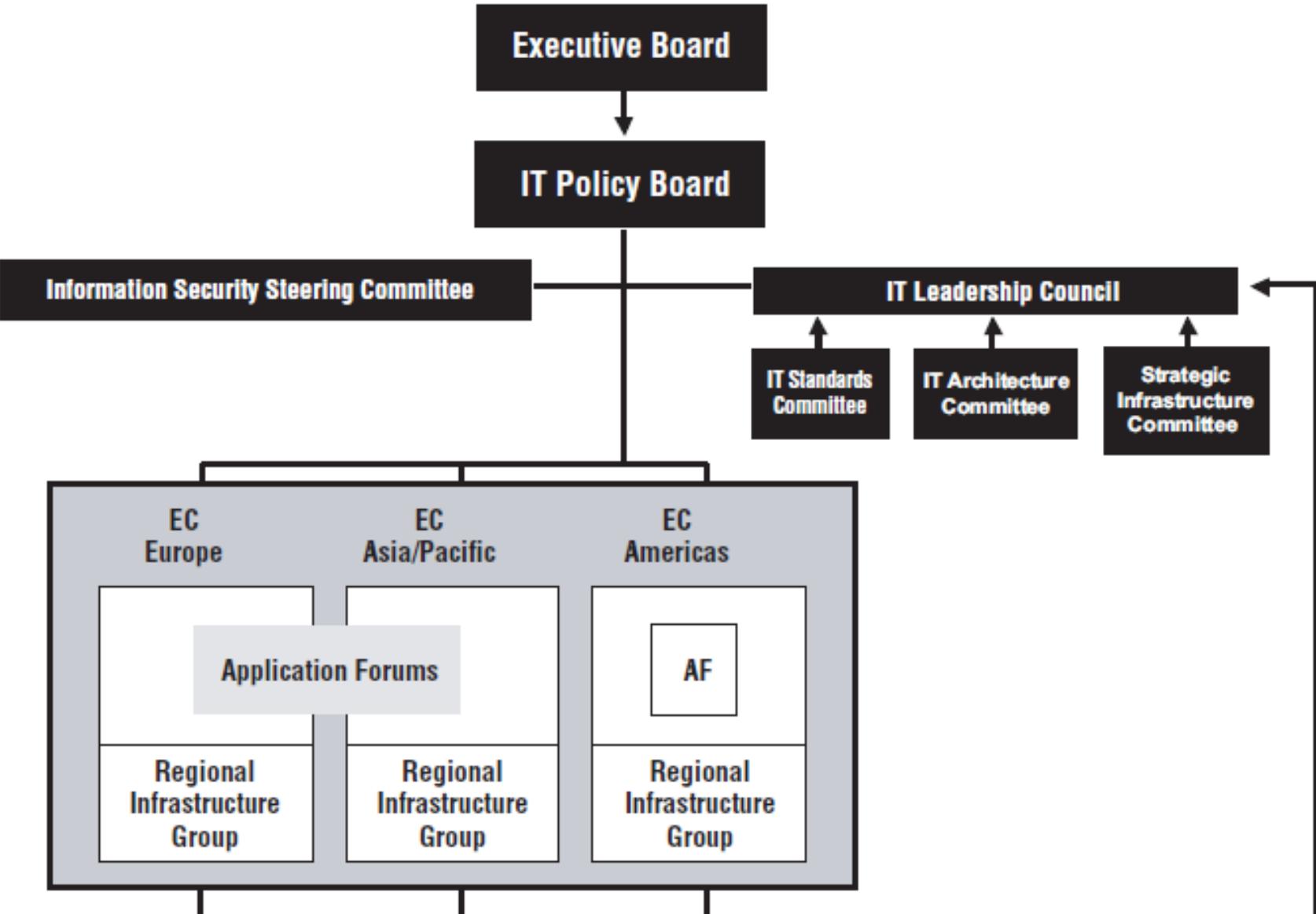


Reasons for (IT) Governance



Information asymmetry

Agency Dilema / Principle - Agent
Problem



Governance vs Management

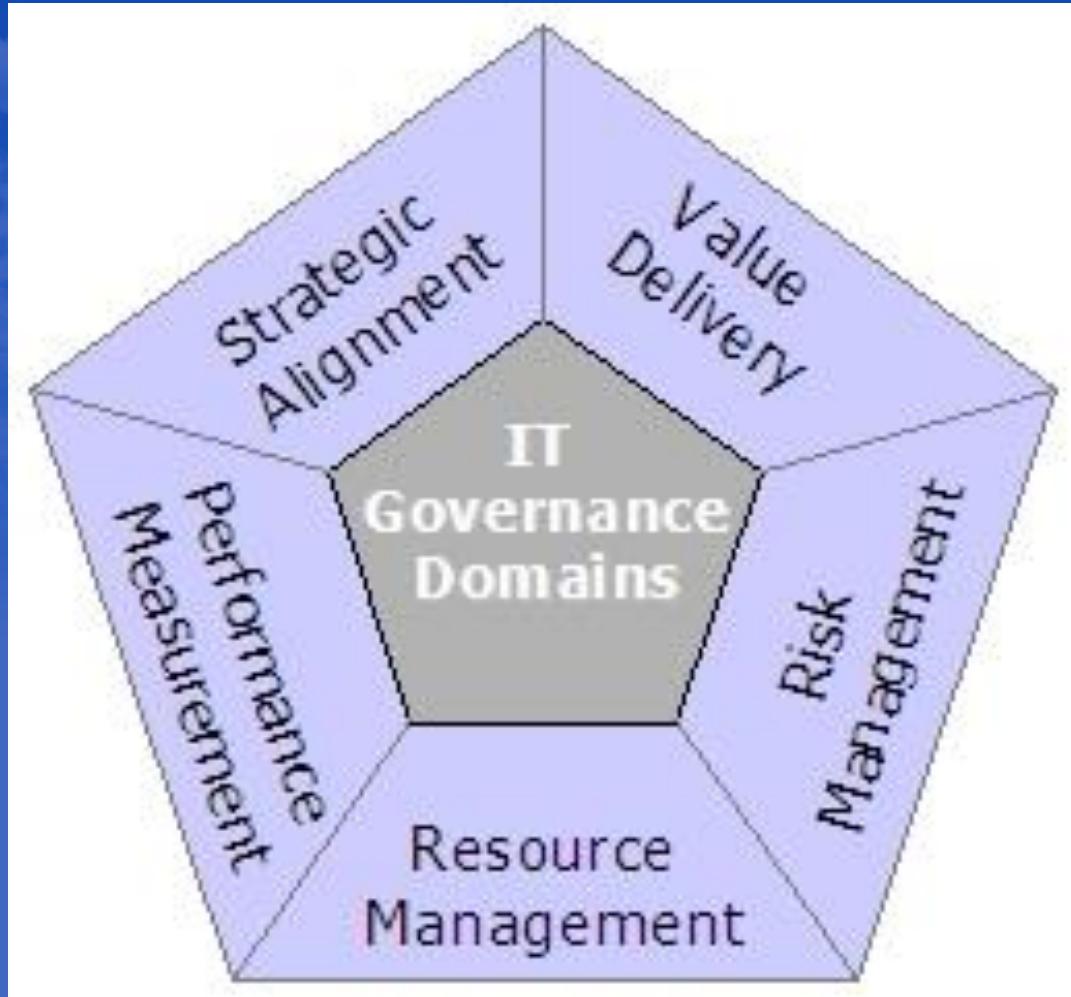
Governance

- Govern
- Authorize decision rights
- Set policy
- Overall responsibility
- Strategic planning
- Resource allocation

Management

- Implements
- Authorized to make decisions
- Enforces policy
- Responsibility for tasks
- Project planning
- Resource utilization

IT Governance Domains



IT Governance Domains

- **Strategic alignment** is concerned with how IT supports the enterprise strategy and how IT operations are aligned with current enterprise operations.
- **Value delivery** ensure that value is obtained from investment in information technology. It involves selecting investments wisely and managing them throughout their life cycle.
- **Performance management** looks at how IT tracks and monitors implementation strategy, how the success of project are determined, at resource usage, and the ensuing process performance and service delivery
- **Risk Management** is about the safeguarding of IT assets, disaster recovery and continuity of operations including security and information integrity.
- **Resource Management** looks at how IT optimizes and manages critical IT resources

IT Value Chain

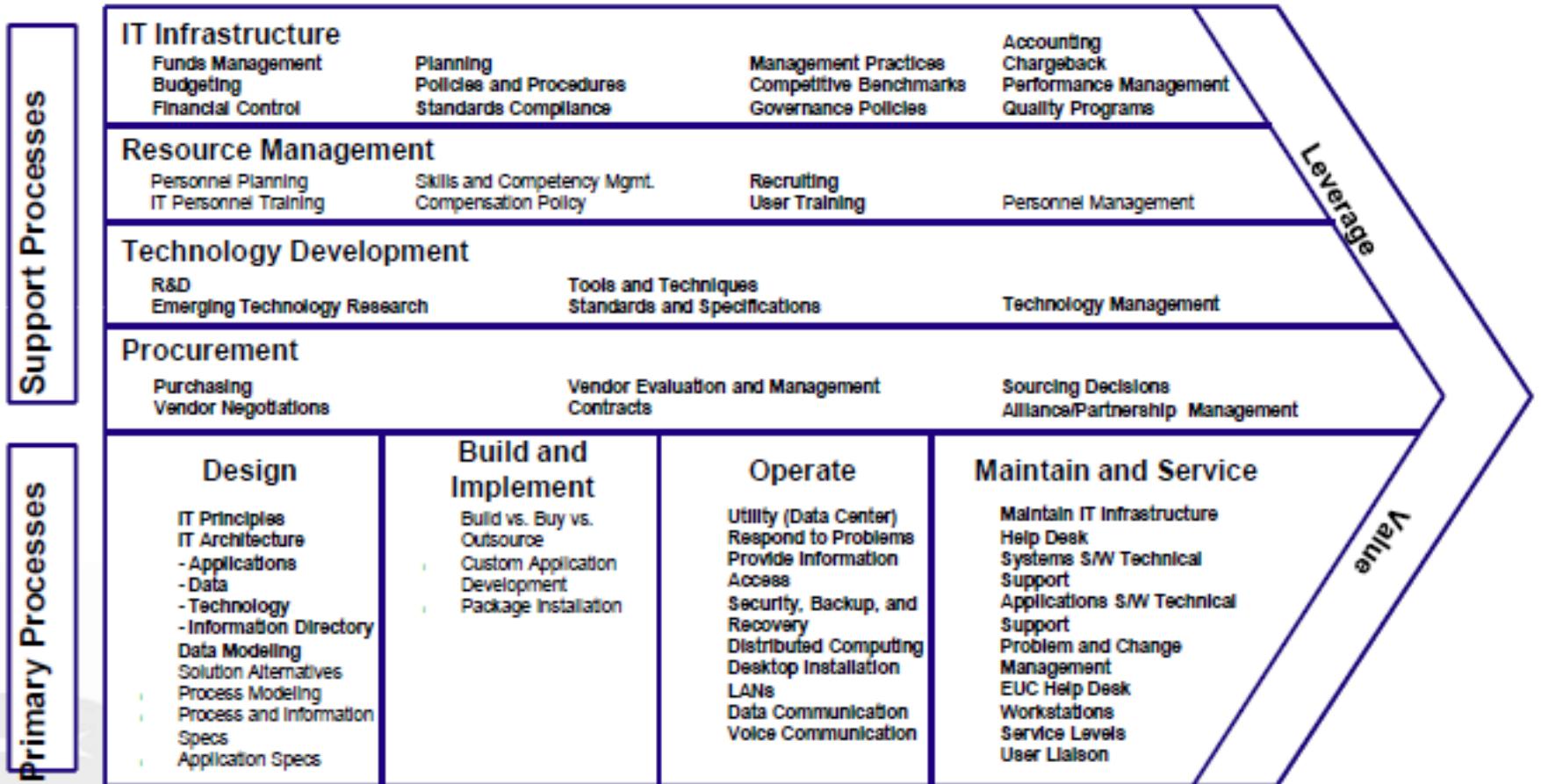
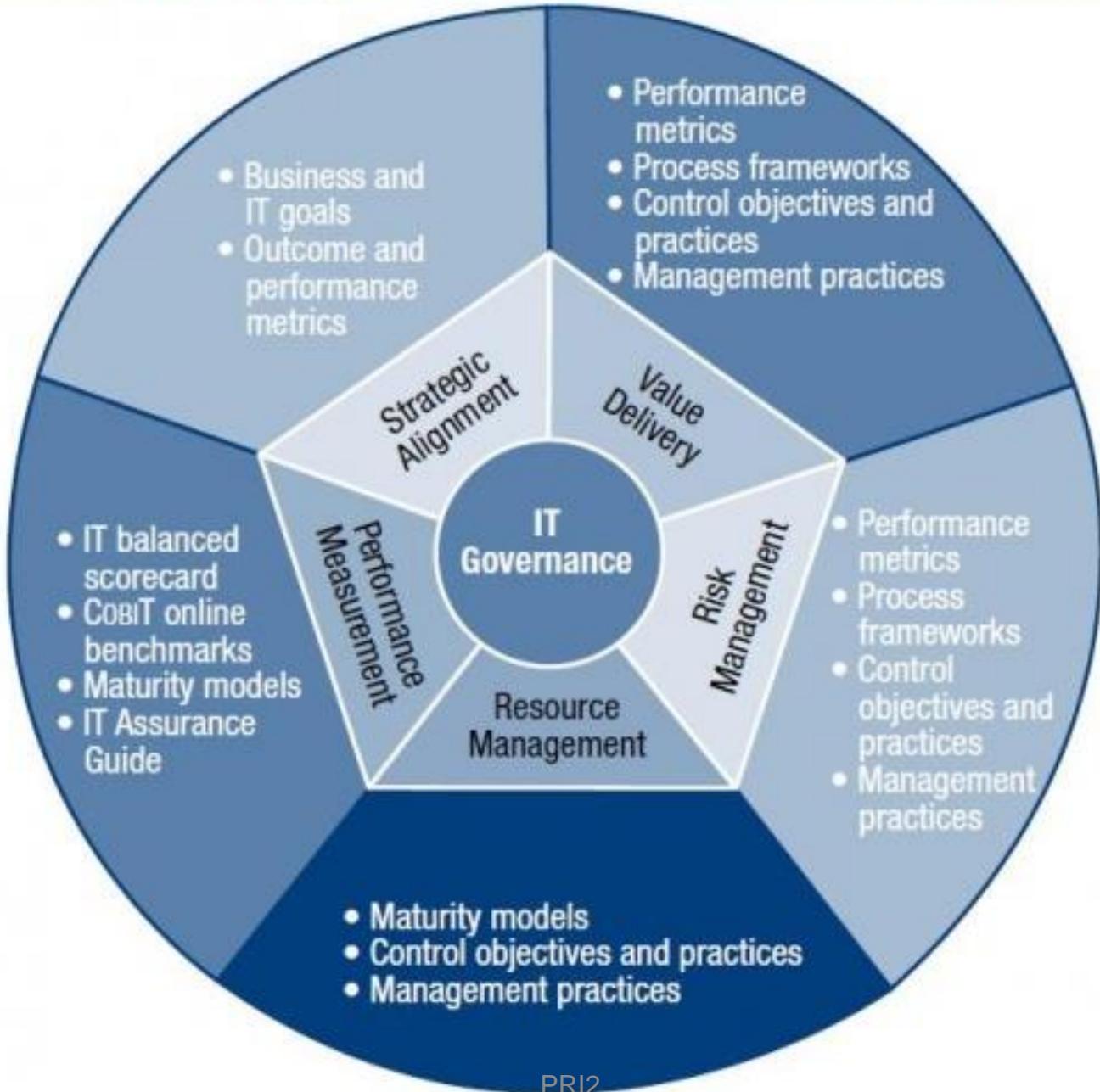


Figure 41—ISACA Framework Components Supporting the IT Governance Focus Areas



IT Governance and ISO standards

- ISO/IEC 38500 – **Governance of IT for the organization** – recommendation of effective and efficient use of IT
- ISO/IEC TS 38501 - **Governance of IT -- Implementation guide** – recommendation for implementation of IT Governance
- ISO/IEC TR 38502 - **Governance of IT — Framework and model** – recommendation to understand key principles and activites of governance and management

ITG v ISO/IEC 38500

- Reasons for using
 - **Conformance** - assuring conformance with obligations (regulatory, legislation, common law, contractual) concerning the acceptable use of IT.
 - **Performance** - ensure that IT use contributes positively to the performance of the organization
- Declaration
 - **Principles** – recommendation of what to focus when making decisions about IT
 - **Models** – descriptions of activities during IT related decision making
 - **Terminology** – explanation of key terms

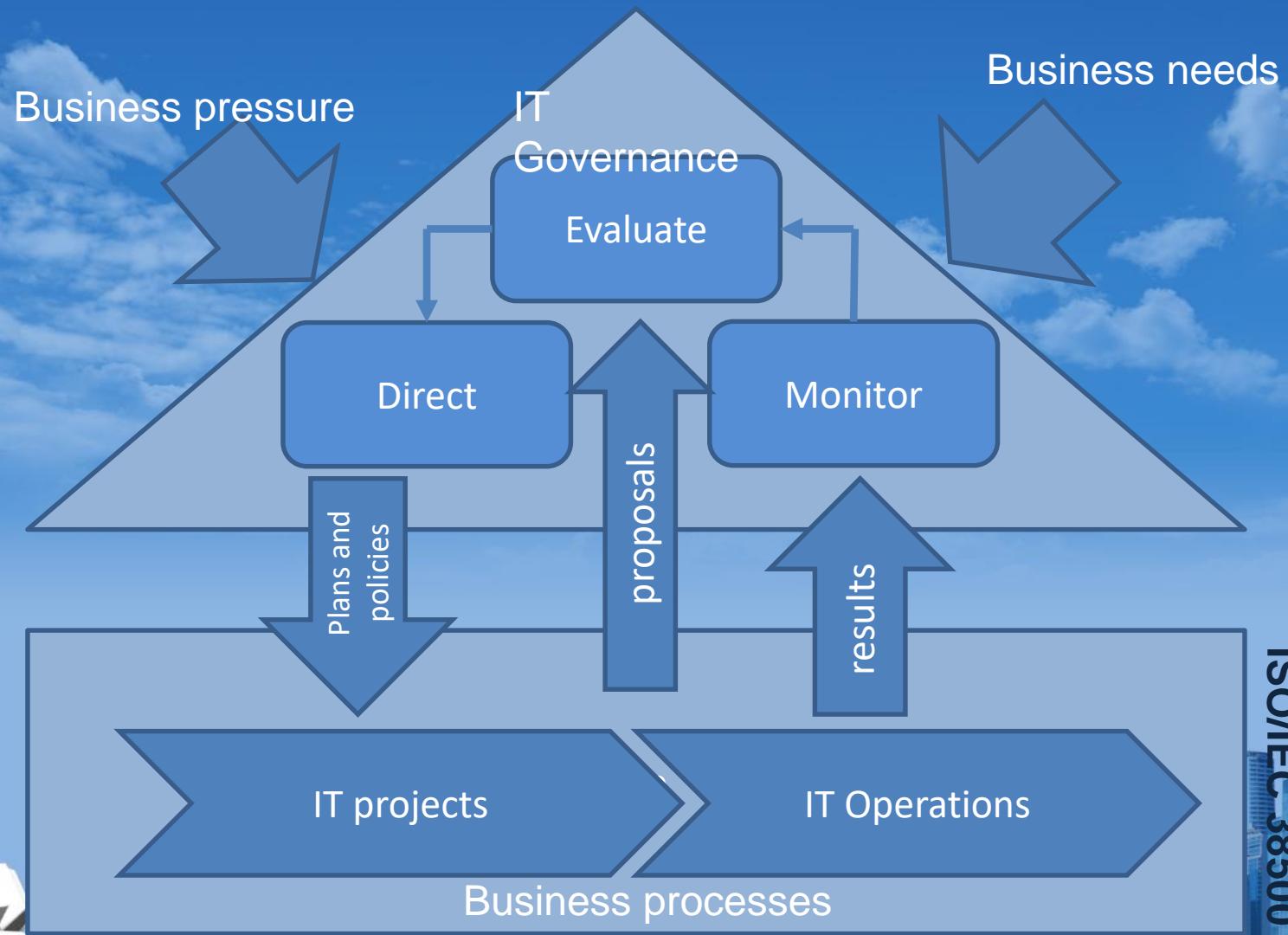


Basic principles

- **Responsibility** – Individuals and groups within the organization understand and accept their responsibilities in respect of both supply of, and demand for IT.
- **Strategy** – business strategy takes into account the current and future capabilities of IT; the strategic plans for IT satisfy the current and ongoing needs of the organization's business strategy.
- **Acquisition** IT acquisitions are made for valid reasons, on the basis of appropriate and ongoing analysis, with clear and transparent decision making.
- **Performance** – IT is fit for purpose in supporting the organization, providing the services, levels of service and service quality required to meet current and future business requirements.
- **Conformance** – IT complies with all mandatory legislation and regulations. Policies and practices are clearly defined, implemented and enforced
- **Human Behaviour** – IT policies, practices and decisions demonstrate respect for Human Behaviour, including the current and evolving needs of all the 'people in the process'.



IT Governance Model



PRI2

35

IT Governance Directions

- Decision framework
- Approaches to strategic alignment and value delivery
- Performance management and measurement
- Resource optimization

What are the key decisions?

- **IT Principles** – clarifying the business role of IT
- **IT Architecture** – defining integration and standardization requirements
- **IT infrastructure** – determining shared and enabling services
- **Business application needs** – needs for purchased or internally developed IT applications
- **IT investment and prioritization** – choosing which initiatives to fund and how much to spend



IT Decision Domains

- IT Principles – High level statements about how IT is used
 - What is the enterprise's desired operating model
 - How will IT support the desired operating model
 - How will IT be funded



IT Decision Domains

- IT Principles – Example 1:
 - Benchmarked lowest total cost of ownership
 - Architectural integrity
 - Consistent, flexible infrastructure
 - Rapid deployment of new applications
 - Measured, improving, and communicated value and responsiveness



IT Decision Domains

- IT Principles – Example 2:
 - Enable the business
 - Ensure information integrity
 - Create a common customer view
 - Promote consistent architecture
 - Utilize industry standards
 - Reuse before buy; buy before build
 - Manage IT as an investment



IT Decision Domains

- IT Architecture: An integrated set of technical choices.
- IT Infrastructure Strategies: Strategies for the base foundation, centrally coordinated services, e. g., network, shared data, etc.
- Application needs: specifying the needs for purchased or internally developed systems.



IT Decision Domains

- IT Investment and prioritization: Decisions about how much and where to invest in IT including project approvals and justification techniques.



IT Governance Archetypes

- Leadership Monarchy
- IT Monarchy
- Feudal
- Federal
- IT Duopoly



IT Governance Archetypes

- Leadership Monarchy: A group of, or individual senior managers (SVP; VP; Dean, Chair). Senior IT manager does not act independently.
- IT Monarchy: Individuals or groups of IT senior managers.
- Feudal: Unit leaders, key process owners or their delegates.



IT Governance Archetypes

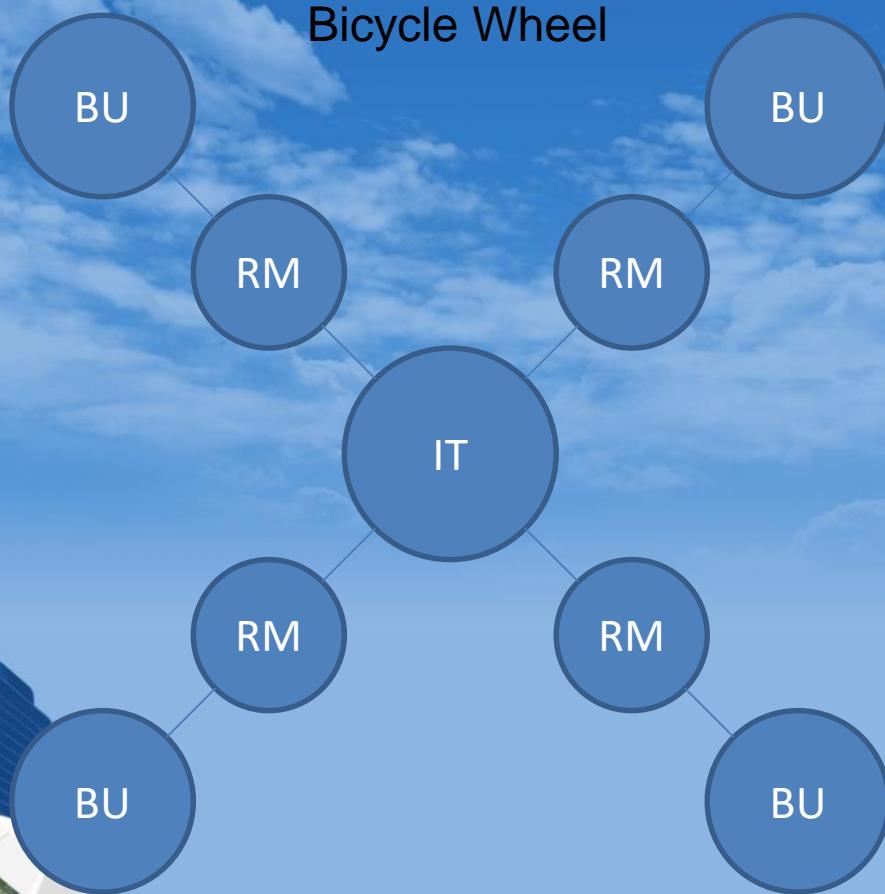
- Federal: Shared by HSC senior management and other College/Unit senior management. May include senior IT management.
- IT Duopoly: IT senior management and one other group, e. g., HSC senior management or College/Unit senior management.



Management Roles in Archetypes

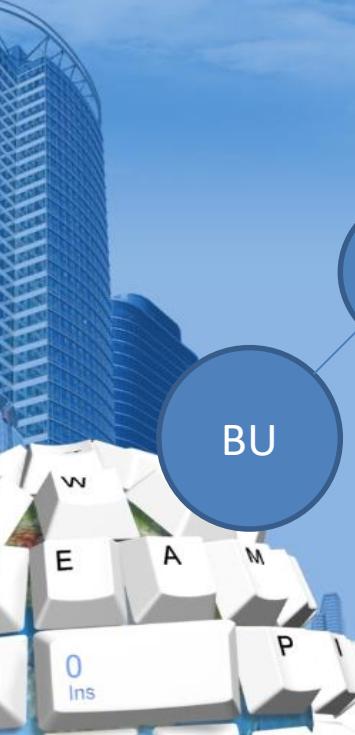
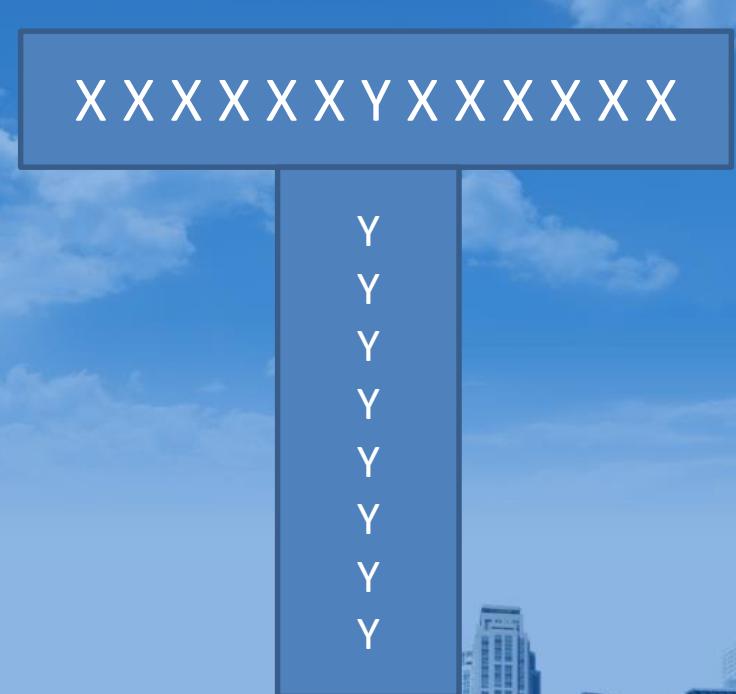
	C-level executives	Corporate IT and/or business unit IT	Business unit leaders or key business process owners
Business monarchy	✓		
IT monarchy		✓	
Feudal			✓
Federal	✓	✓	✓
	✓		✓
Duopoly	✓	✓	✓

IT Duopoly



Bicycle Wheel

T-Shaped



Decision Governance Matrix

<i>Domain Style</i>	IT Principles	IT Architecture	IT Infrastructure Strategies	Application Needs	IT Investment
Monarchy					
IT Monarchy					
Feudal					
Federal					
Duopoly					

Input/Decision Governance Matrix

<i>Domain Style</i>	IT Principles		IT Architecture		IT Infrastructure Strategies		Application Needs		IT Investment	
	Input	Dec	Input	Dec	Input	Dec	Input	Dec	Input	Dec
Monarchy										
IT Monarchy										
Feudal										
Federal										
Duopoly										

Decision models

Decision / Archetype	IT Principles		IT Architecture		IT Infrastructure Strategies		Business Application Needs		IT Investments	
	input	decision	input	decision	input	decision	input	decision	input	decision
Business monarchy	0	27	0	6	0	7	1	12	1	30
IT monarchy	1	18	20	73	10	59	0	8	0	9
Feudal	0	3	0	0	1	2	1	18	0	3
Federal	83	14	46	4	59	6	81	30	93	27
Duopoly	15	36	34	15	30	23	17	27	6	30
Anarchy	0	0	0	1	0	1	0	3	0	1
Don't know	1	2	0	1	0	2	0	2	0	0

DuPont Case study

Decision / Archetype	IT Principles		IT Architecture		IT Infrastructure Strategies		Business Application Needs		IT Investments	
	input	decision	input	decision	input	decision	input	decision	input	decision
Business monarchy										
IT monarchy			Arch. Team	IT Leaders	Comp. Centers	IT Leaders				
Feudal	Business Unit							Business Leaders		
Federal									Sen. Execs. Business Leaders	Corp IT. Business Leaders
Duopoly		Senior Execs. Corp. IT					Senior Execs. Corp. IT			



DBS Bank Case study

Decision / Archetype	IT Principles		IT Architecture		IT Infrastructure Strategies		Business Application Needs		IT Investments	
	input	decision	input	decision	input	decision	input	decision	input	decision
Business monarchy		Corp. Office CIO						Corp. Office CIO		Corp. Office Project council
IT monarchy				Arch. Office	CIO IT Leaders	CIO IT Leaders				
Feudal										
Federal							Business Leaders process owners			
Duopoly	Business Leaders IT Leaders		Business Leaders IT Leaders					Business Leaders IT Leaders		

Evaluation of IT Governance

- Different perspectives (Environment, ITG arrangement, understanding ITG, ...)
- Questionnaires
- Different scales
- Tools
 - Based on ISO 38 500
 - IT Governance Performance Survey (Weill & Ross)
 - IT Governance Toolkit (Calder-Moir)
 - etc



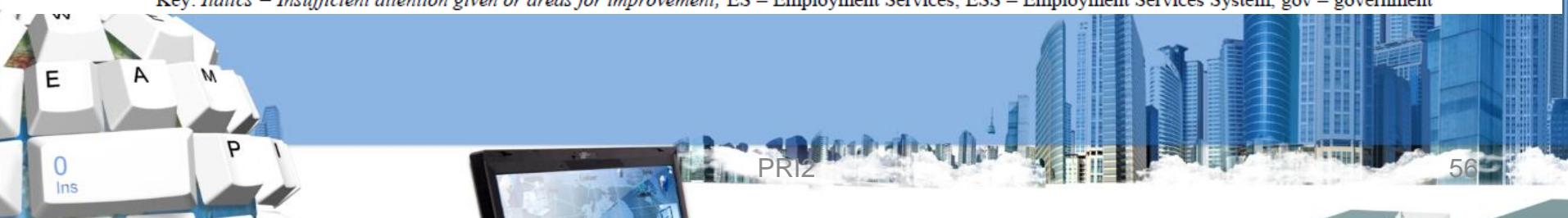
Evaluation based on ISO 38 500

- Dimensions
 - Principles (Strategy, responsibility, ...)
 - Activities (EDM)
- Evaluation
 - Intersection of dimensions
 - Requires company know how
- Scale
 - Scale (No activity ... excellent performance)



Principle	Evaluate	Direct	Monitor
1. Responsibility	<ul style="list-style-type: none"> Establishment of an advisory board Agents involved via public consultations 	<ul style="list-style-type: none"> Advisory board established new role out and a transition reference group facilitated changeover Direction provided through boards/groups No obvious CIO reporting, but a gov. mandate 	<ul style="list-style-type: none"> Regular ES IT Advisory Group meetings reviewed/advised on progress to advisory board <i>No obvious CIO reporting, but project was important as it was a gov. mandate</i>
2. Strategy	<ul style="list-style-type: none"> New ES = gov. mandate to ↑ employment part., address skills in demand & sustainable emp. Gov. needed to ensure all functions in the new ES were supported in the redeveloped ESS Agents were invited to respond to the Minister's call on ES future direction - >260 submissions Limited priorities for reengineering were based upon feedback - but driven by gov. requirements 	<ul style="list-style-type: none"> ESS arose from reviewing the gov's social inclusion agenda + deficiencies with ES Consult: CEO, face-to-face & live meet sessions Provider consultation via a 3rd Party Software and Data Integration Survey Public consultations with providers & stakeholders All ES functions supported in redeveloped ESS Feedback via the transition reference group 	<p>This was evidenced by:</p> <ul style="list-style-type: none"> The project being deployed on-time Gov. and provider requirements being addressed Regular advisory board meetings which reviewed feedback on discussion papers, consultation sessions and monitored progress <p><i>However, there no obvious assessment of business value</i></p>
3. Acquisition	<ul style="list-style-type: none"> Tender process: ES to have an IT contact person Gov. mandate, therefore guaranteed budget of \$4.9 billion over the next 3 years 	<ul style="list-style-type: none"> Appropriateness via public and advisory boards, a discussion paper, exposure draft, job seeker sat. surveys, program evals and auditor-gen. reps 	<ul style="list-style-type: none"> <i>Historically systems were evaluated infrequently</i> <i>Following ESS roll-out, there weren't any obvious reviews against business strategy/investment mix</i>
4. Performance	<ul style="list-style-type: none"> Current system was basis for the new ESS, so analysis of deficiencies formed a base line Advisory board planned, resourced and commissioned the project Renewed training of service providers was seen as a risk 	<ul style="list-style-type: none"> Redev. funded by gov's Social Inclusion Agenda Roll-out was built on gov. public IT services, assets and resource portfolios New ESS refers eligible job seekers to providers efficiently & sensitively + providers have give <i>No evidence of a budget based on full economic life-cycle costs, thus no refinement or sign-offs</i> 	<ul style="list-style-type: none"> Solely gov. funded so assessment of value one-sided Outcomes measured in terms of cost savings and improved ESS functionality Deployment on schedule, <i>but no obvious comparisons against the business strategy/investment mix</i>
5. Conformance	<ul style="list-style-type: none"> Regular meetings of the ES IT Advisory Group reviewed and advised on progress of the ESS 	<ul style="list-style-type: none"> Change management and training were put in place to facilitate achievement of benefits Policies to ensure all ES functions in new ESS Tender process: ES to have an IT contact person Conformance through public and advisory boards, a discussion paper, exposure draft, job seeker sat. surveys, program evals and auditor-gen. reps 	<ul style="list-style-type: none"> Regular meetings of the ES IT Advisory Group reviewed and advised on progress of the ESS
6. Human Behaviour	<ul style="list-style-type: none"> Consult to ensure job seeker & provider needs app. <i>No public info on current/future demand for HR to support IT-enabled investment + shortfalls</i> <i>Resource reqs spec. but interdependencies not</i> 	<ul style="list-style-type: none"> New ESS refers all eligible job seekers to contracted providers efficiently and sensitively Impacts on resources were taken into consideration e.g. training service providers 	

Key: *Italics = Insufficient attention given or areas for improvement; ES = Employment Services; ESS = Employment Services System; gov = government*



ITG Performance Survey (Weill & Ross)

- Questionnaire about ITG
- At least 10 managers
- ITG outputs
 - Cost effective use of IT
 - Grow focused use of IT
 - Resource focused use of IT
 - Flexibility focused use of IT
- Otázky
 - How important are the ITG outputs for your company?
 - How ITG can impact the outputs?



ITG Performance Survey (Weill & Ross)

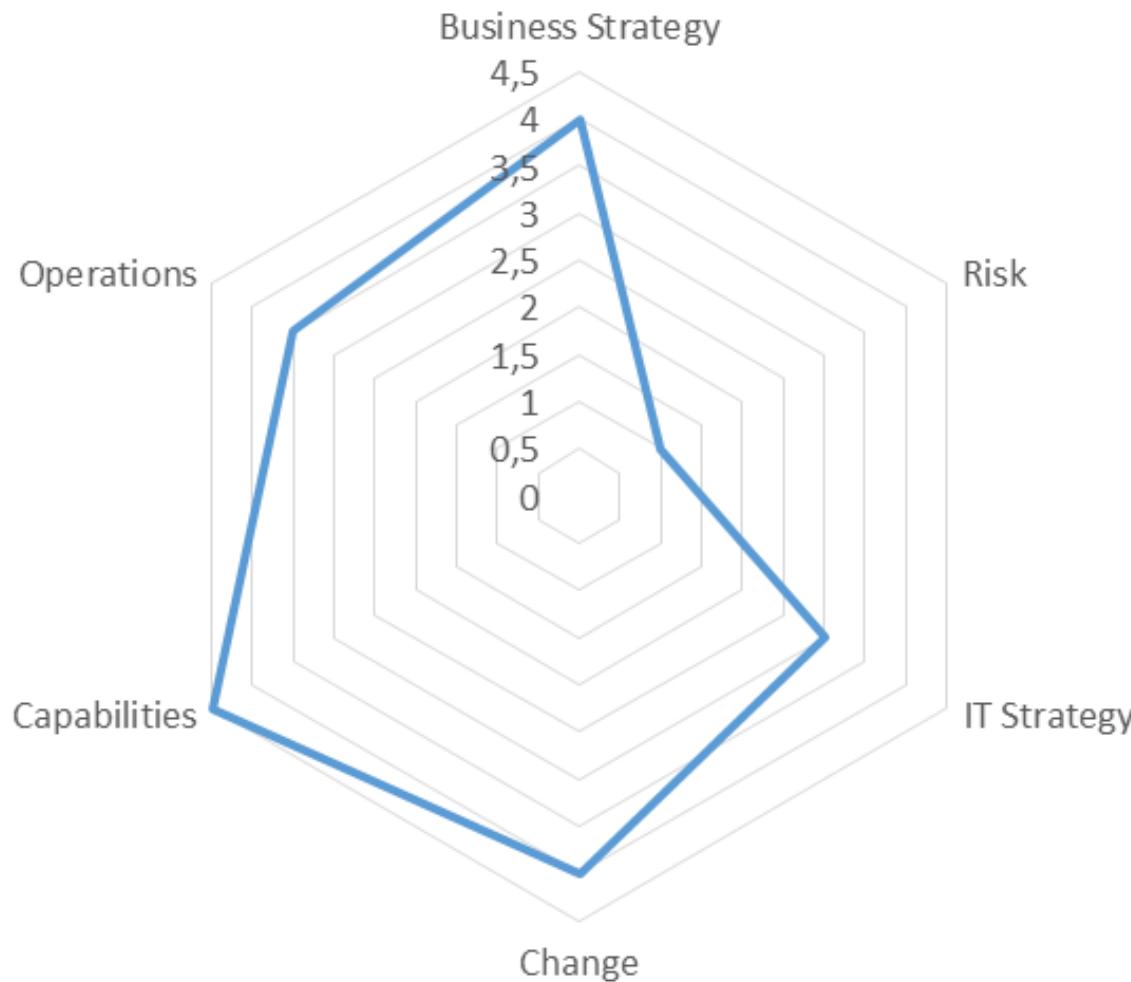
cont.

- Represents relative importance of ITG in companies
- IT Governance performance
= importance * impact / 5 * importance * 100
- Results in range 20 – 100
- Average company 69, the best third more than 74

IT Governance Toolkit

- Questionnaire focused to reveal potential weak sides
- 6 perspectives each with 8 questions
- 12 respondents
- Results depicted as spider chart

IT Governance Toolkit (cont.)

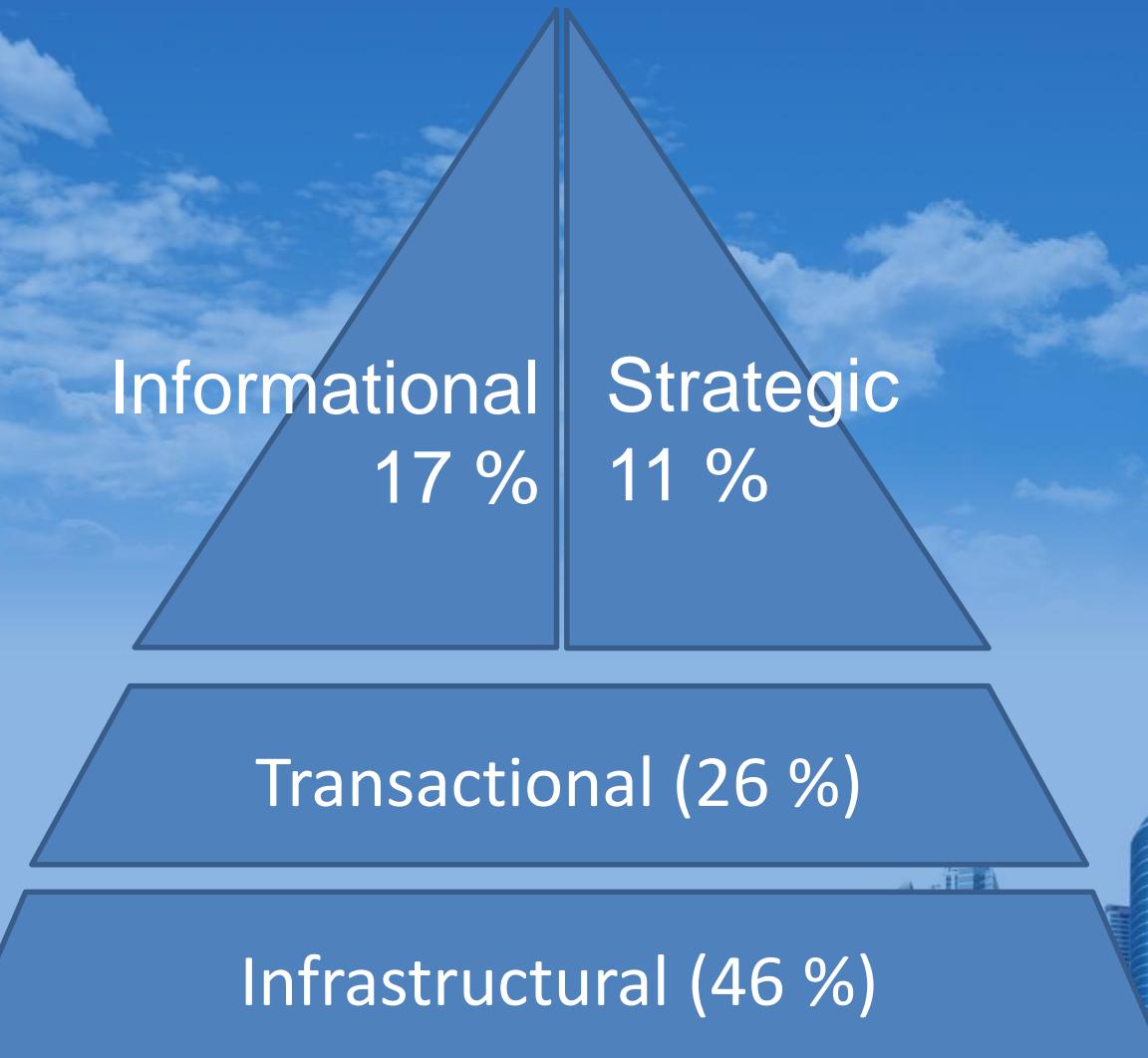


Investment categories Val IT

- **Mandatory** – necessary due to legislation, security standards, long-term contracts, etc.
- **Continuity** – to maintain day to day operation
- **Discretionary**
 - **Strategic** (to create new products/services and enter new markets)
 - **Transformational** (to gain competitive advantage or major innovation)
 - **Transactional** (to process transactions more efficiently)



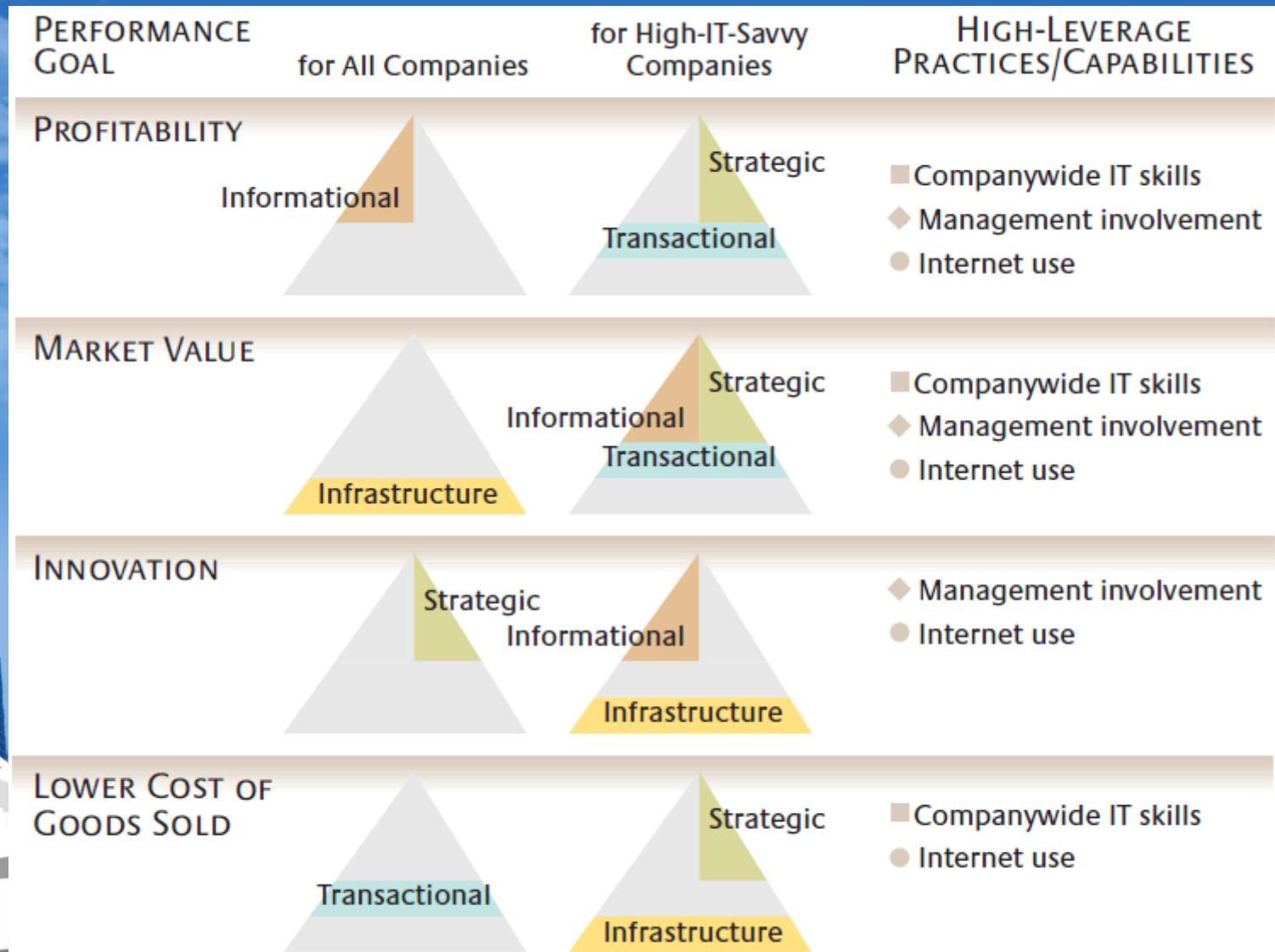
Investment categories based on MIT CISR



Risk profile in portfolio

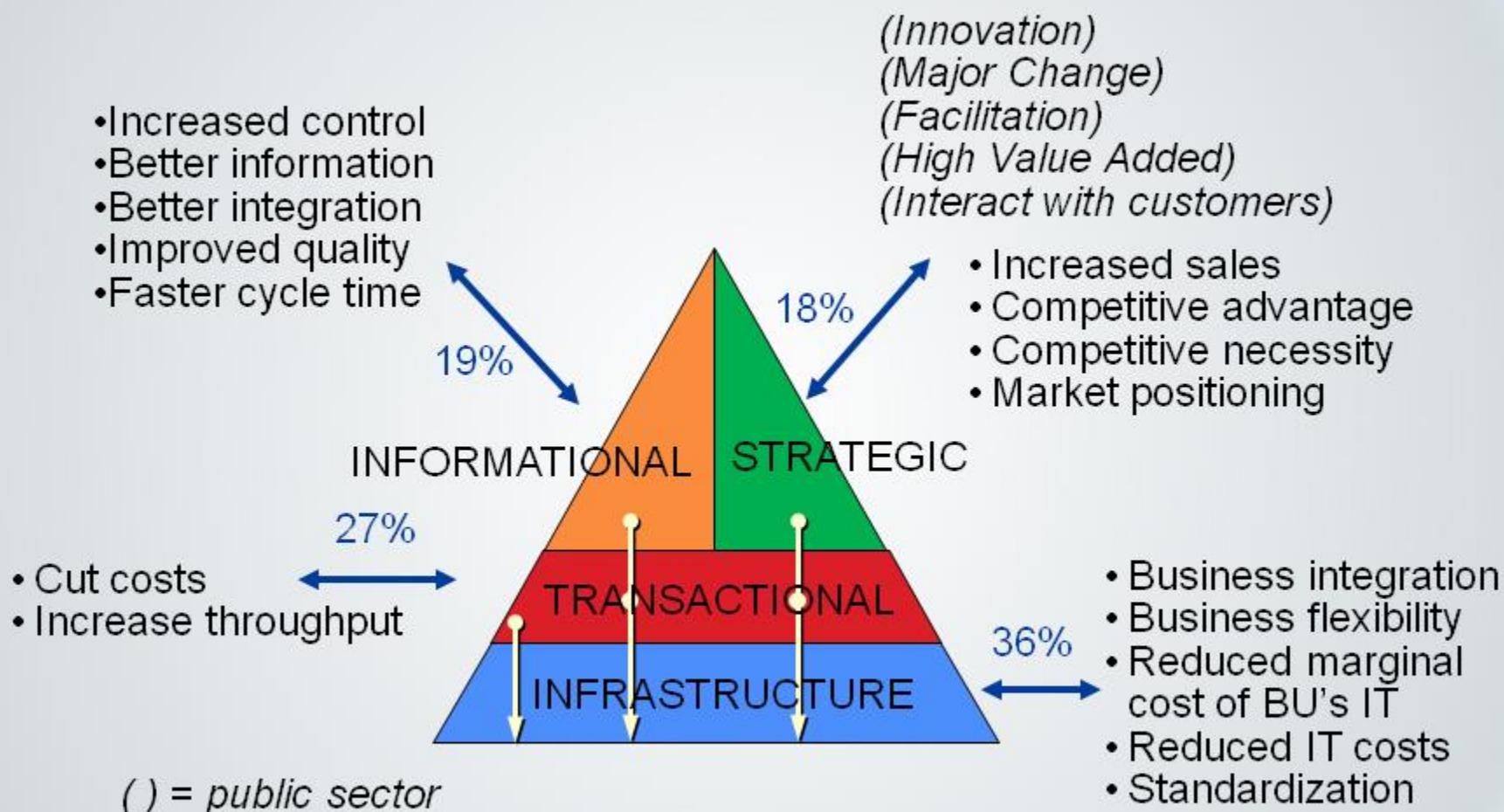
Category	Risk	Compensation
Strategic	Highest risk, up to 50 % failure rate	Correlation with higher profit from new specialized products
Infrastrukturní	Moderate risk due to longer lifecycle and uncertain business and technological development.	Correlation to higher market cost and short-term cost.
Informační	Moderate risk due to diffuculty on action information to create business value	Correalation with higher margin
Transakční	Lowest risk with solid returns 25 – 40 %	Strong correlation with cost decrease

Investment priorities Weil



Rethinking IT as an Investment Portfolio

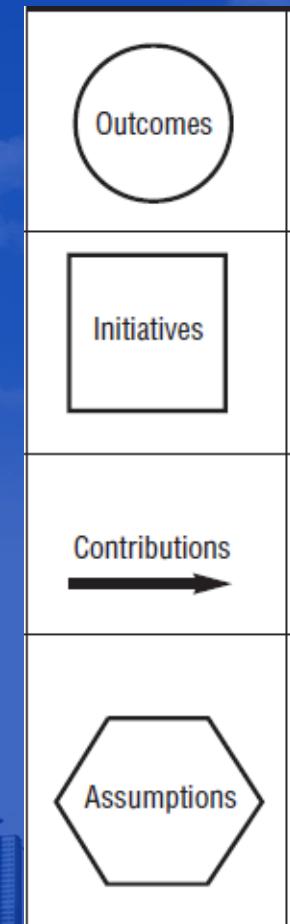
— Four Different Asset Classes



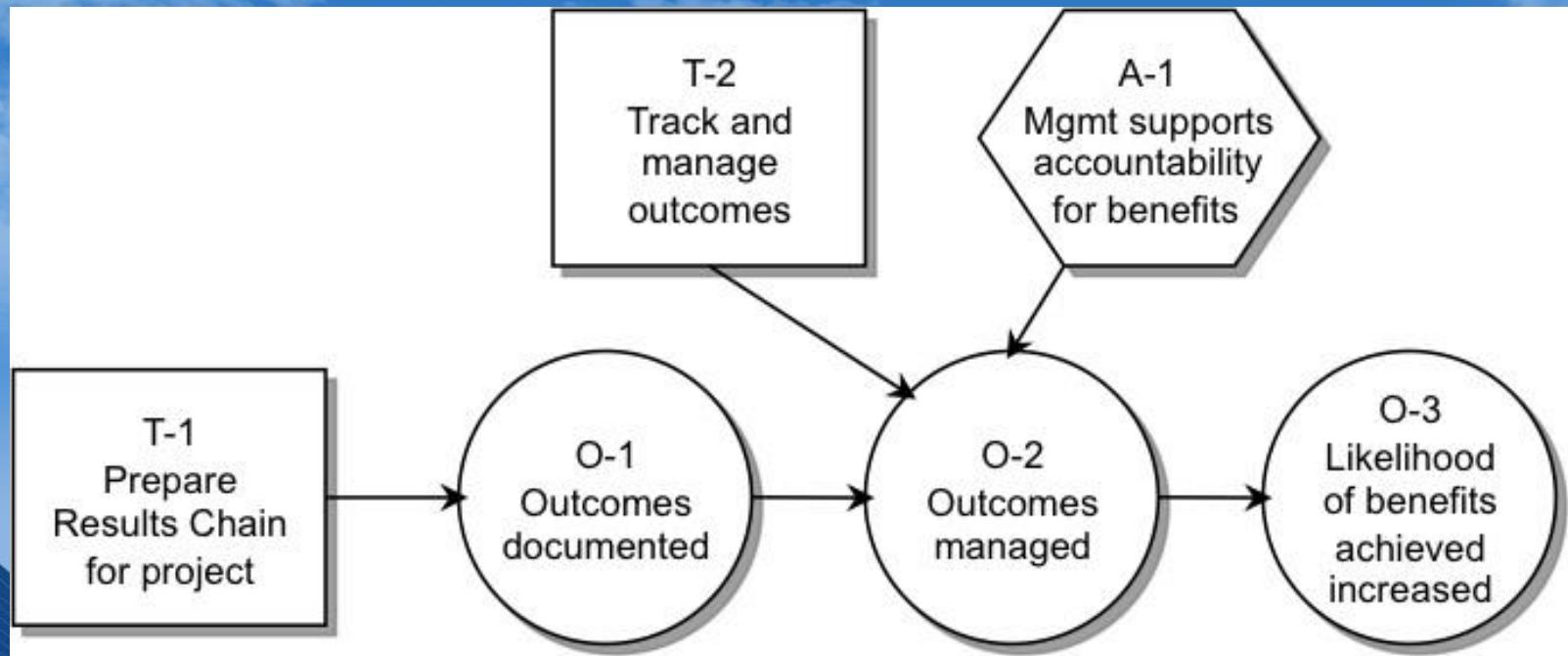
Source: Framework from P. Weill & M. Broadbent, *Leveraging the New Infrastructure: How market leaders capitalize on IT*, Harvard Business School Press, 1998. Data: Percentages are 2009 total \$IT spending (operations+depreciation) from 1091 firms in 77 countries from Gartner CIO Survey.

Results Chain

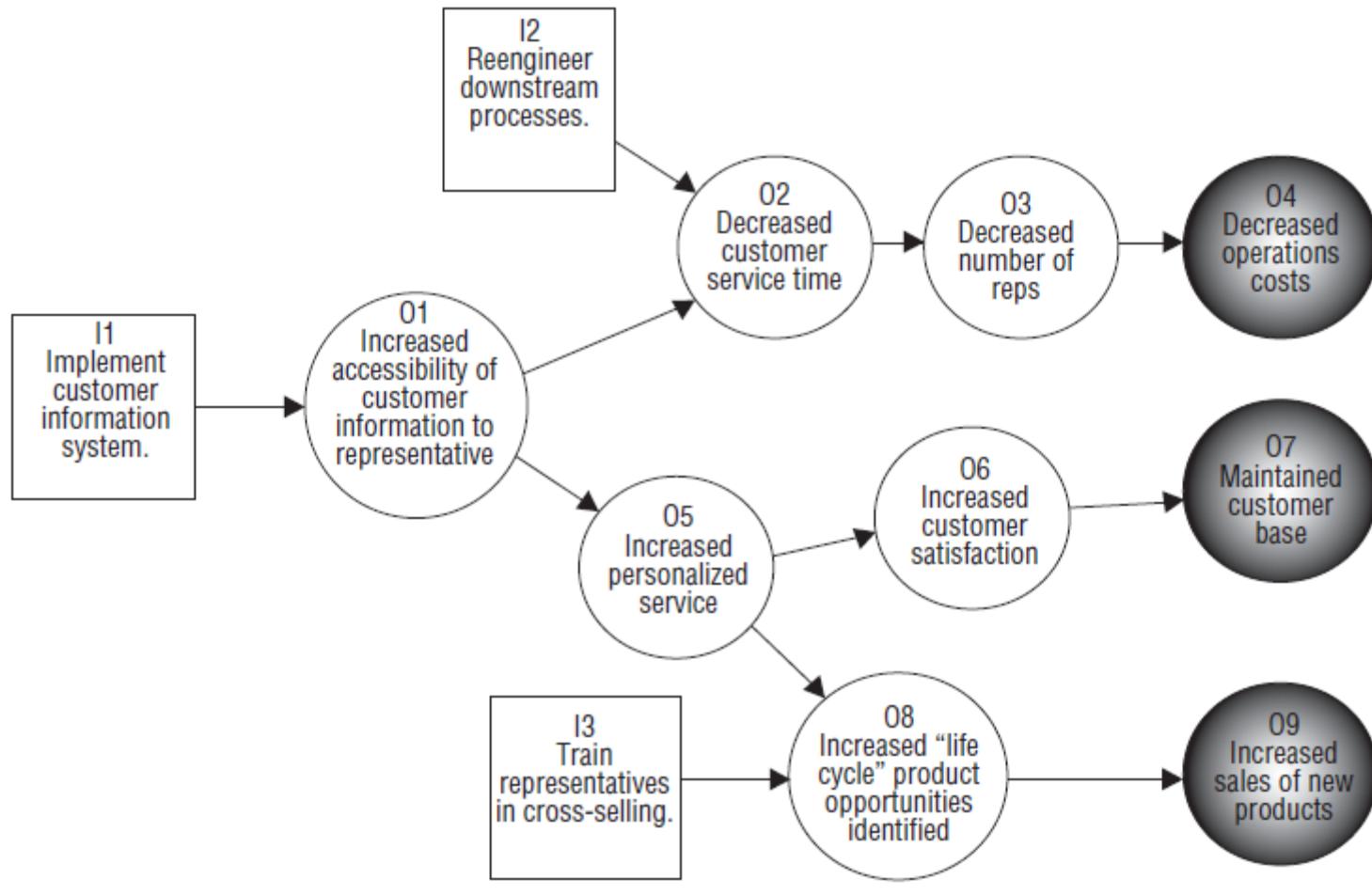
- How to connect key elements in investment programmes
- Key elements
 - Outcome
 - Initiative
 - Contribution
 - Assumption
- Rule:
 - Each initiative should result in an output.
 - Outputs should be measurable.

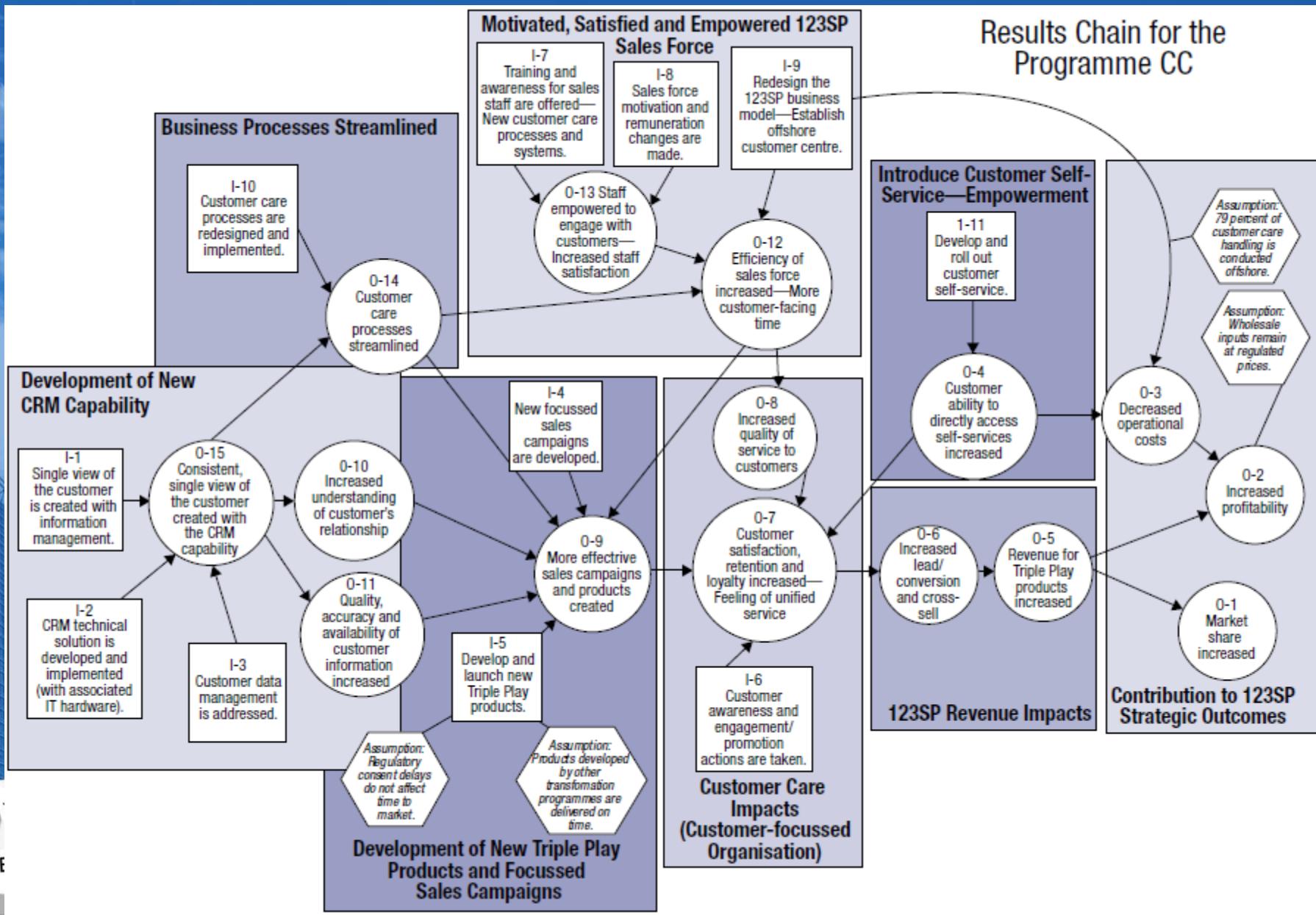


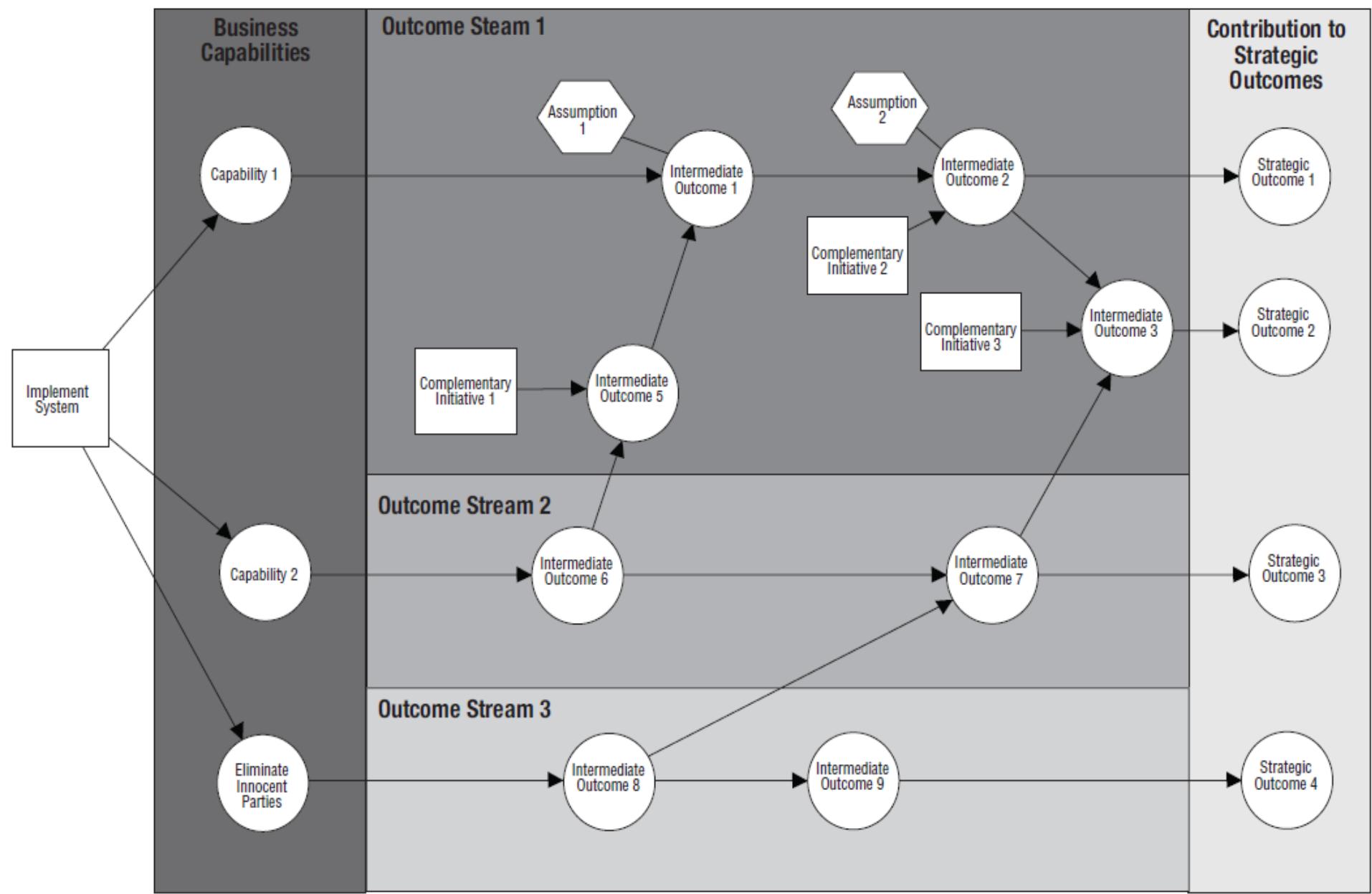
Example Results Chain

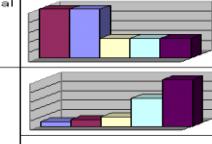
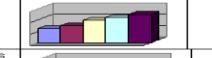


Example Results Chain II







#	Outcome	Description	Contribution	Metric / Frequency	Measurement Method	Baseline Value	Target Value / Date	Tolerance Limits	Action if outside Tolerance Limit	Accountability	Benefits Profile
1a	Timely Gov't-wide reports (to Stats, RG, Finance)	Consolidated Monthly Statement of Financial Operations (MSFO). 15th of the month reports to Finance.	Departments to RG to Finance	Timeliness (# of days) for report submission as listed in Target Value / monthly	Log of the date of report submission	25 days to Finance	Depts. submit initial Trial Balance by 5th working day, final by 7th day RG makes Period Closing Entries (PCE) by xth day, Finance submits statements by 15th of the month, / by April 1, 2001	Can group depts. for missing target value / date No tolerance for report submission under normal circumstances.	Contingency to estimate missing depts. data. Belonging to DM of dept. that has missing data.	Minister of Finance for 15th of month statements. Dmt SFO for Trial Balance	
1b	Timely Gov't-wide reports (to Stats, RG, Finance)	Annual Financial Statements from Public Accounts	TB to OAG	OAG may need to rethink audit approach to speed overall process.	Timeliness (# of days) for report submission as listed in Target Value / annually	Log of the date of Annual Financial Statements submission	Tabled typically when Parliament resumes sitting after summer recess (typically Sept. / Oct.)	Up to (date to summer recess), if AG can complete their audit.	TBD	TBD	RG / TBS for annual statement submission
2	Increased Competence in using Management Information	Higher competence of managers (including Financial managers) in using financial and management information	Learning Strategies and more comprehensive financial reports	Same type of self-assessment Recognition by SFO	CCMD course to help managers increase competence. Or PSC Leadership Competence assessment focused on Financial Mgmt.	Current assessment level	Basic understanding of FIS by April 1, 2001. Use of Financial info by April 1, 2002. Advanced understanding by April 1, 2003.	TBD	TBD	Managers themselves, DM for their departments, TBS/CCMD for materials required	
3a	Facilitate maintain, retrofit, sell analysis	Better Analysis in TB submissions from depts.	Better understanding of TCO, better business case to maintain / replace assets	Assessment of quality of decisions and TB submissions.	Ask TB Program Analysts - Set criteria for best quality TB submissions, and TB analyst rates against it	TBD	TBD	TBD	Coach weaker departments to increase the quality of TB submissions	Program Managers	
3b	Facilitate maintain, retrofit, sell analysis	Better Analysis for Managers within departments	Better understanding of TCO, better business case to maintain / replace assets	Assessment of quality of decisions within the department	Ask TB Program Analysts - Set criteria for best decisions, and then Management rates against it	TBD	TBD	TBD	Coach weaker managers to increase the quality of their analysis	Program Managers	
4	Better information for planning and decision making	Integrated Framework of costs and non-financial info that is timely, relevant, etc.		Completeness of full info, timeliness, frequency, level, accuracy, ease of use	Survey of managers (target group). Will vary by department	Survey today of these attributes of the information	TBD	TBD	TBD	Joint accountability - Finance / Systems and Managers	
5	More informed decision making	Better information available to support decision making	More comparability of financial and non-financial information		Survey selected managers. Were decisions based on better information? Was the decision better? Sample x decisions across government - source is RPP. Examining cause of decisions	TBD	TBD	TBD	TBD	Managers themselves, SFO for their departments	
6	Increased Client Satisfaction	More responsive, timely, accurate service, especially when service is mission-based. Client is end-recipient of a program.	Front-line relationship with client	Survey results as per survey, by department.	Client surveys. Probably work through Service Canada initiative	As per Service Canada	An increase of x points by 2002.	TBD	TBD	Managers of front-line service providers	
7	Key Results achieved / improved	Programs outcomes as described in the DPR and RPP	Program delivery of the departments	Annual RPP on program outcomes	DPR / RPP	Current Year DPR / RPP	Subsequent year DPR / RPP	TBD	TBD	DM or equivalent of the departments	
8	Clarified accountability for performance achieved	Better information to compare Performance Agreement to program outcomes / results	Better information available	Annual Performance Review	Annual Performance Evaluation	'Satisfactory' rating	Better than a 'Satisfactory' rating	Minimum of 'Satisfactory'	Counseling for the manager	Managers themselves and their supervisors	
9a	Increased service / program delivery efficiency	Lower Resourcing costs "Doing the same with less"	Better Allocation of Resources	Cost of resources: \$\$, Human, assets / ongoing basis	Cost and service level required	Current state of efficiency	x% decrease per year	minimal decrease, i.e. less than x%	Revisit program delivery methods	Program Managers	
9b	Increased service / program delivery efficiency	Greater service with the same cost "Doing more with the same"	Better Allocation of Resources	Service levels, cost required	Service level and cost required	Current state of service levels	x% increase per year	minimal increase, i.e. more than x%	Revisit program delivery methods	Program Managers	
10	Increased service / program operational effectiveness	Evaluate portfolio of programs to provide the best Results for Canadians	DPR / RPP	Program results / annually	Public Accounts, AG's Value for Money reviews	Current state of program operational effectiveness	x% increase per year	Meet current mandate of program	Revisit purpose and value of program	DM and Treasury Board (management board) ministers	



	More Streamlined Processes	Income Officer Safety	Community Servicing by Police	Safer Road User Behaviour	Crime Prevention	Improved Investigation Quality	Improved Relationship with other Agencies	V2.0 Full
	High	Medium	High	Low	High	High	Medium	
General Crime	Major	Appreciable	Minor					5.9
Tree View	Major	Appreciable	Minor			Appreciable		7.6
MO	Minor				Appreciable	Appreciable		4.5
Stolen Vehicle	Appreciable					Appreciable		3.4
Offender/Offence Management	Significant							2.3
FV/CA stats	Minor	Minor	Minor		Minor		Significant	6.1
Allocation/Filing	Appreciable							1.7
Linking (intra, multi)	Significant					Appreciable		4.0
E-mails to VSS, Child Abuse	Appreciable		Minor				Minor	3.7
DOI		Appreciable						1.4
Execute Search Warrant		Minor				Minor		2.0
Create Search Warrant	Minor					Appreciable	Minor	3.7
Enter Crash			Minor			Minor		2.3
Report on Crash	Appreciable							1.7
Person Match and Merge	Appreciable	Minor	Minor			Appreciable	Appreciable	6.8
Vehicle Entity								0.0
Necessary Changes								0.0
Total	23	7	7	0	3	12	5	57



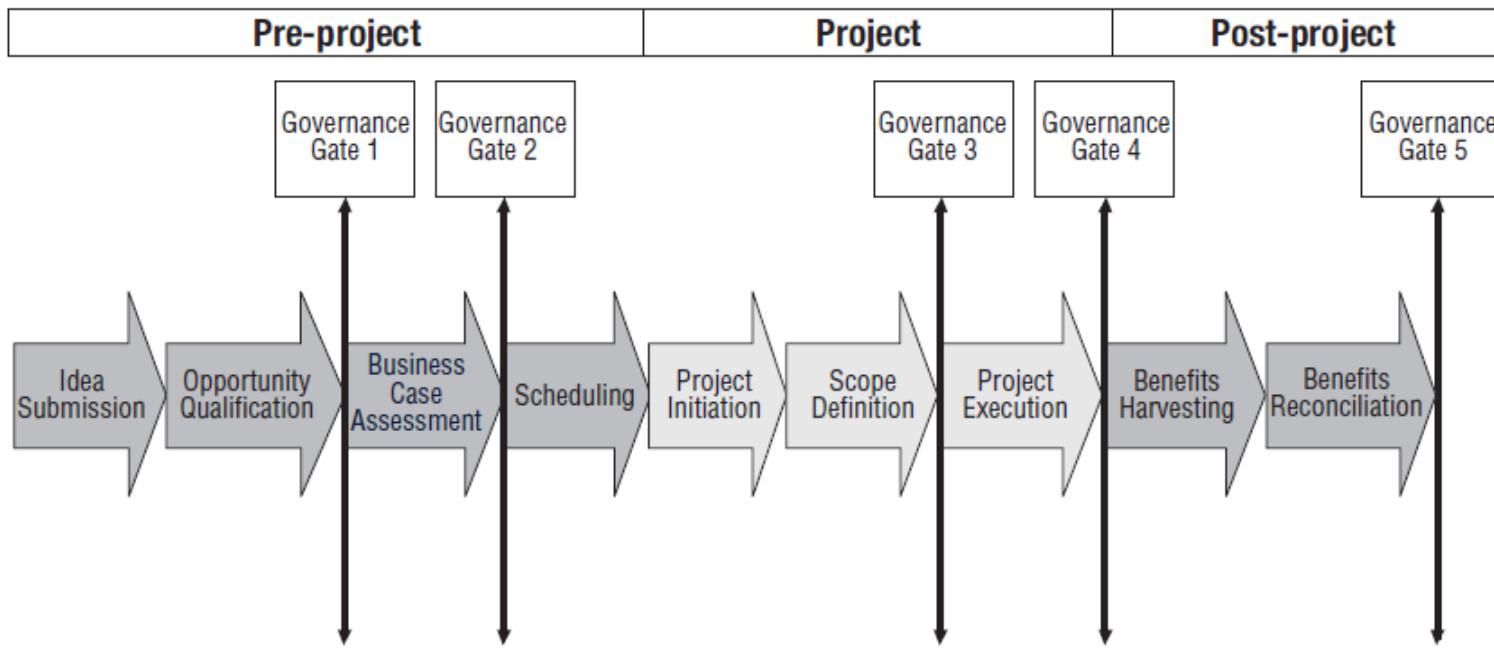
Value Governance Lifecycle

- Základní fáze
 - **Před projektová** – vyhodnocení nových nápadů; v případě vhodnosti rozvedení do business case; při splnění hodnotících kritérií zařazení do programu dle návazností a rozpočtových možností.
 - **Projektová** – vlastní realizace projektu
 - **Po projektová** – kontrola a vyhodnocení přínosů vzhledem k příslibu stanovením v business case
- Průběžné kontroly
 - Posuzování charakteristik investice a aktualizace business case
 - Vykázání přínosů a poučení do dalších projektů



Ukázka VGLC

Figure 3 – Value Governance Life Cycle



PRI2

80

IT SERVICE MANAGEMENT

Basic components

- **Service and quality** – exploring the relation between the service quality from the point of view of the customer and quality management from the point of view of the provider
- **Separation of Duties** – distributing the responsibilities for determining objectives and their realization
- **Organization and policy** – deals with strategic planning, company culture and human resources together with coordination of business and IT processes
- **Processes management** – management of IT processes and IT services



Separation of Duties

- In IT it is understood as the separation of responsibilities of service definition and service provision (previously the service definition was the duty of IT personnel and was mostly based on the application functionality)
- Enables the independent evaluation of quality of services provided by those who use it



IT service

- Activity realized using IT resources that has a value for the consumer
- It is provided by an IT process (viz see the IT service model)
- Characteristics
 - Intangible
 - Cannot be stored
 - Requires cooperation with the user



ITIL (IT Infrastructure Library)

- ITIL is a public framework that describes Best Practice in IT service management.
- It provides a framework for the governance of IT, the ‘service wrap’, and focuses on the continual measurement and improvement of the quality of IT service delivered, from both a business and a customer perspective.
- Part of ISO 9000 implementation
- Declares terminology that is used for internal and external communication



Core ITIL Terminology

- "Capabilities" consists of functions and processes.
- A "function" is a related collection of people (units of organizations) specialized to perform certain types of work and responsible for specific outcomes. Each function is responsible for implementing an activity or process.
- Each "process" defines a structured set of activities designed to accomplish a specific set of objectives.



Core ITIL Terminology II

- "Value" is a combination of utility and warranty.
- "Utility" is functionality offered by the service to meet a particular need (offers good fit for purpose).
- "Warranty" are promises or guarantees that a service will meet its agreed requirements (offers good fit for use) -- availability, capacity, security, etc..

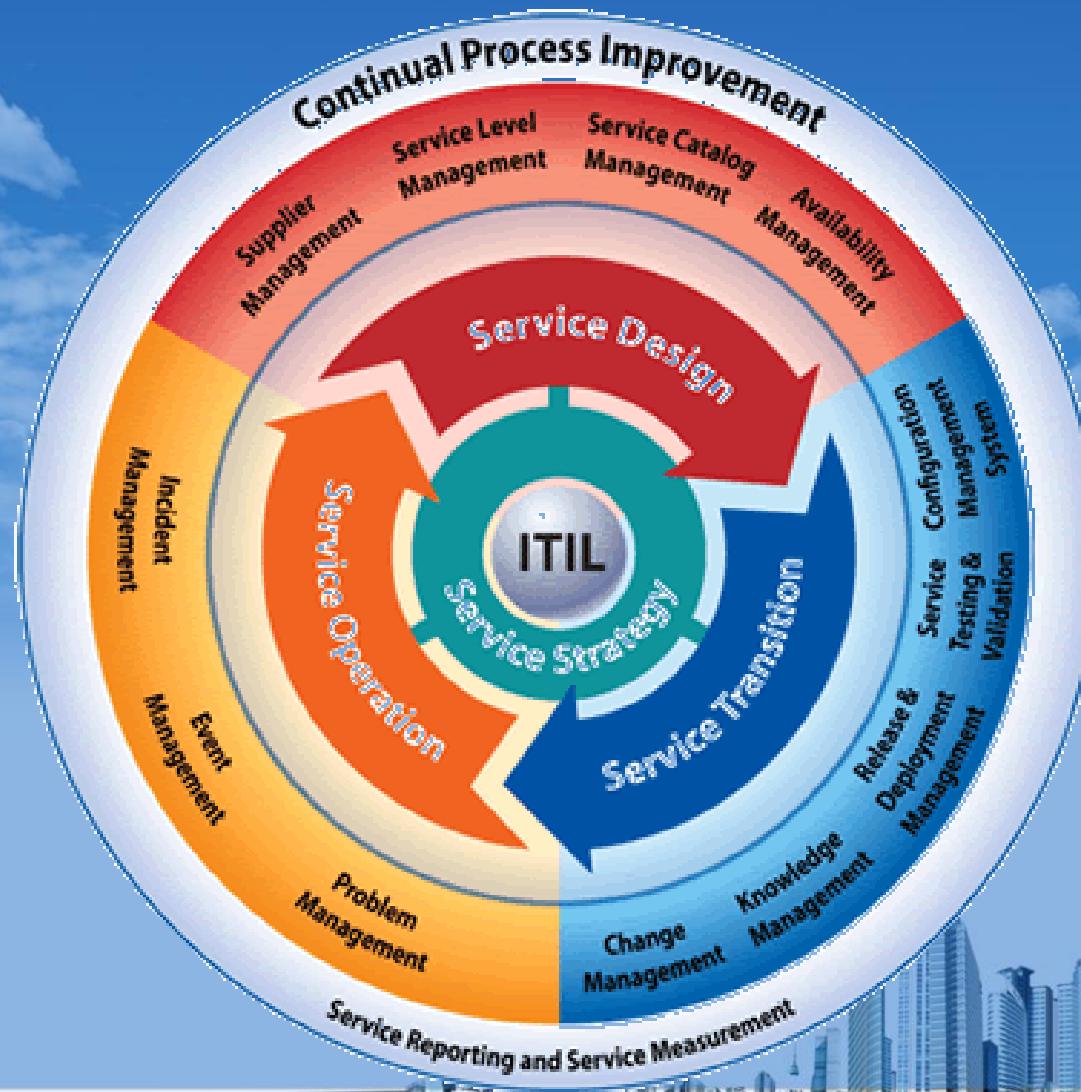


Core ITIL Terminology III

- A "process owner" is the role responsible for ensuring that a process is fit for purpose.
 - Defines processes
 - Assists in process design
 - Reviews process strategy
- A "process manager" is the role responsible for the operational management of a process.
- A "service owner" is the role responsible for the initiation, transition and ongoing maintenance and support of a particular service.
 - Coordinates with other owners
 - Ensures delivery meets requirements
 - Identifies opportunities for improvement
- "Service Management" is a set of specialized organizational capabilities for providing value to customers in the form of services.
- "Services" is the "means of delivering value to customers by facilitating outcomes customers want to achieve, without the ownership of specific costs and risks."



ITIL v3

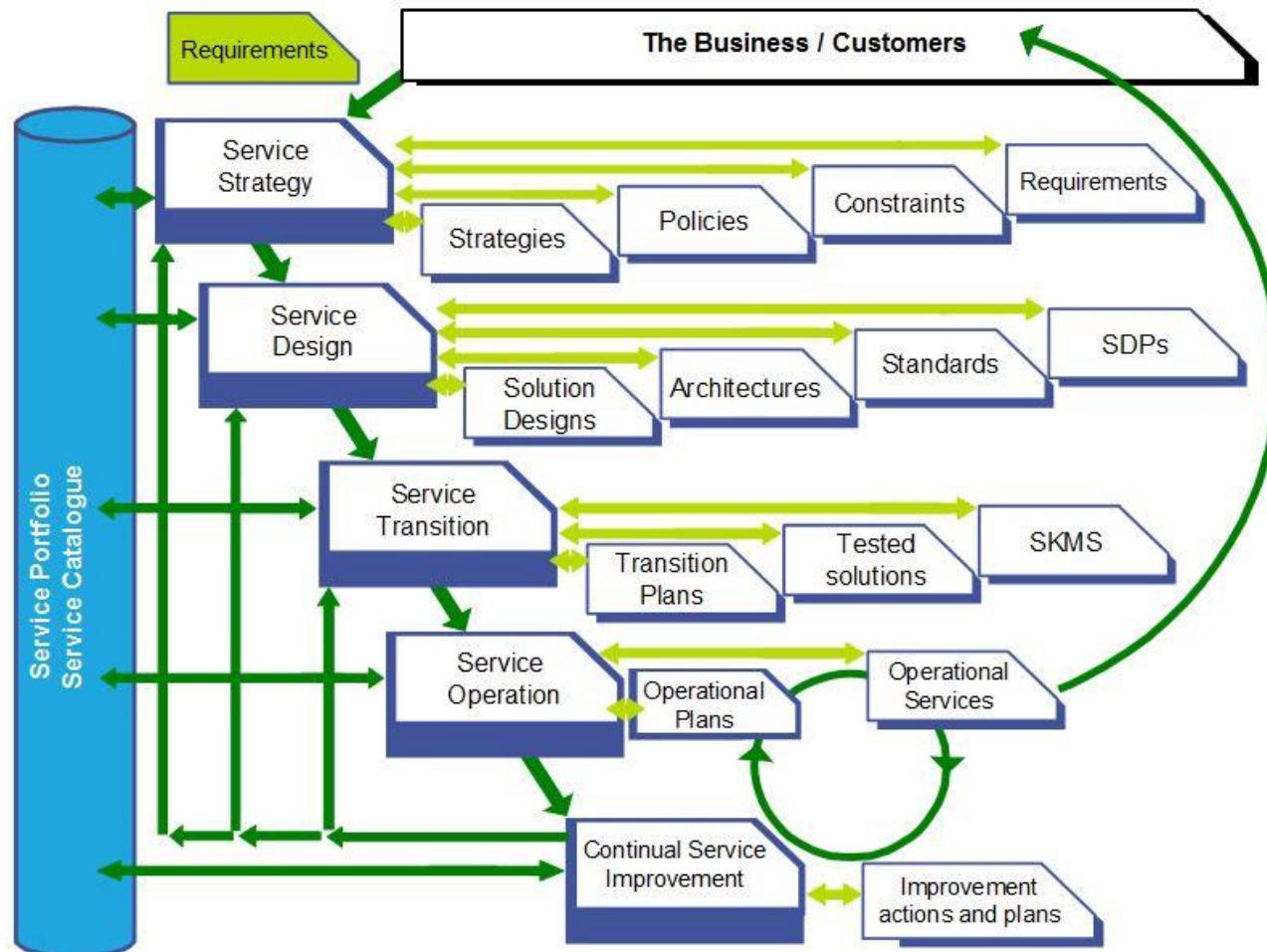


Core modules

- Service Strategy
- Service Design
- Service Transition
- Service Operation
- Continual Service Improvement



IT Service Lifecycle



ITIL® is a Registered Trade Mark, and Registered Community Trade Mark of the Office of Government Commerce, and is Registered in the U.S. Patent and Trademark Office.

Advantages

- increased user and customer satisfaction with IT services
- improved service availability, directly leading to increased business profits
- and revenue
- financial savings from reduced rework, lost time, improved resource
- management and usage
- improved time to market for new products and services
- improved decision making and optimized risk.



Incident lifecycle

1. User reports a problem to a **Service Desk**
2. **Incident Management** processes the incident
3. **Problem Management** analyses the what caused the incident in collaboration with **Capacity Management**; **Service Level Management** notify about possible SLA violation -> Request For Change
4. **Change Management** coordinates RFC
5. **IT Financial Management** provides rationale for cost of upgrade
6. **IT Service Continuity** in cooperation with **Change Management** recovers correct configuration



Incident lifecycle (cont.)

7. **Release Management** controls change implementation and notify **Configuration Management** with details about upgrade
8. **Availability Management** decides about upgrade of HW to ensure availability and realibility
9. **Customer Relationship Management** communicates with customer and keeps him/her informed about the progress



Service Desk

- Single point of contact
- Communication interface between users and other ITSM processes
- Records problems and requirements of the users
- Previously known as Help Desk but Service Desk has a wider use



Service desk goals

- **Service restoration** – minimal impact on business
- **Problem resolution** – help in problems
- **Application support** – help in situations when there is no problem



Satisfying the goals

- Multi-channel communication
- Use of knowledge base
- Monitoring



KPI

- **Time to identify problem** – the difference between the raise of the problem and its reporting
- **Time to diagnose the problem** – difference between reporting and understanding the cause
- **Time to correct the problem** – difference between time the problem was diagnosed and solving the problem



Incident Management



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Incident management (IM)

- Restores normal operations as quickly as possible with the least possible impact on either the business or the user, at a cost-effective price.



Incident

- An '**Incident**' is any event which is not part of the standard operation of the service and which causes, or may cause, an interruption or a reduction of the quality of the service.



Determining priority

- Incident management determines the priority based on teh urgency and impact
 - **Impact**- usually the count of involved users
 - **Urgence** – acceptable time to solve the incident
- => **impact * urgency = priority**
-> cost estimation

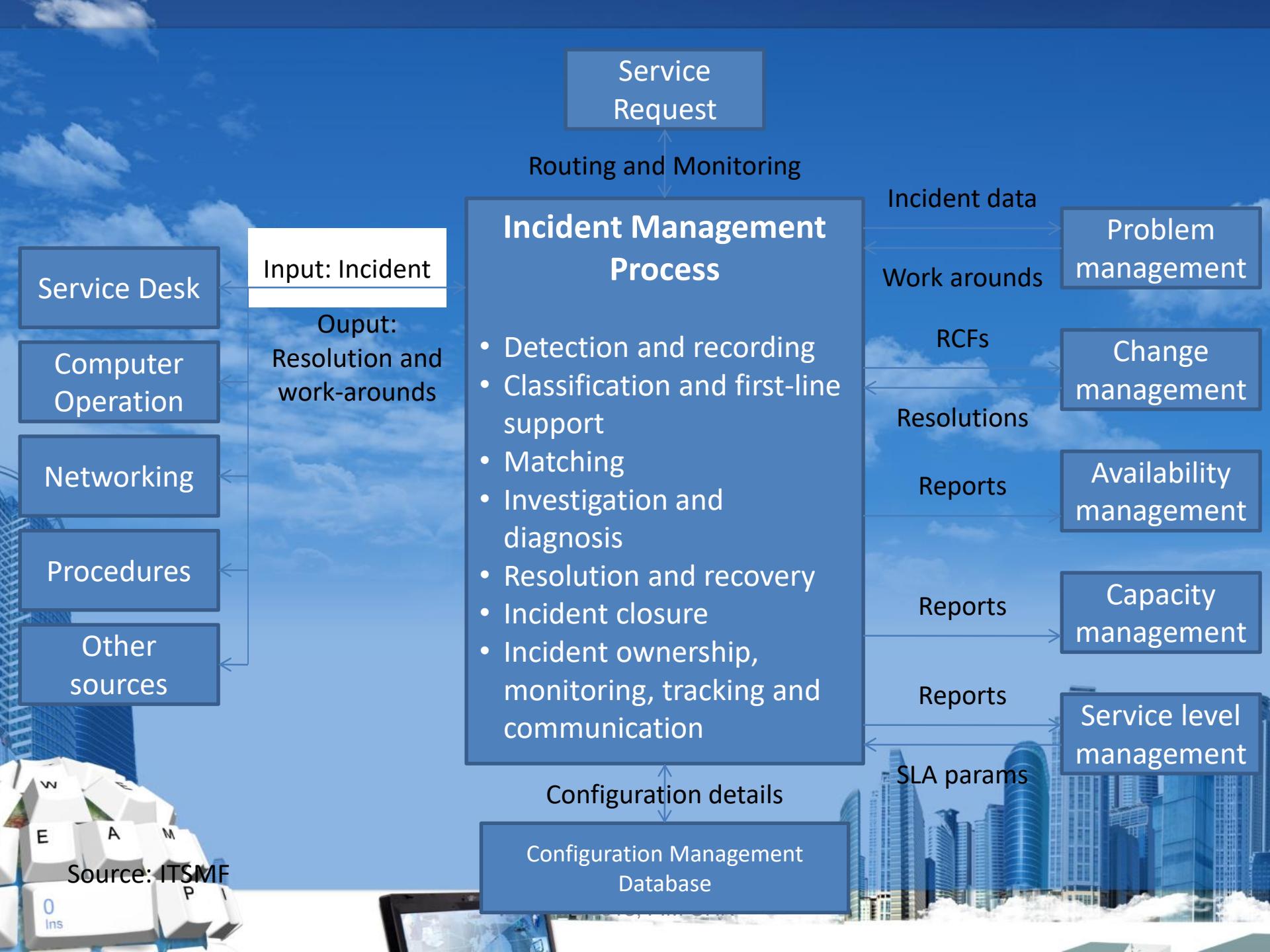
Urgency	Impact		
	High	Middle	Low
High	critical	high	middle
Middle	high	middle	low
Low	middle	low	plan



Incident escalation

- ITIL incident escalation is recognition that if an incident cannot be resolved at the first point of contact – namely the Service Desk, then it must be passed to a second level support group. This escalation is referred to as functional escalation.
- Hierarchic escalation is typically required when an incident is of a serious nature or a multiple set of incidents mean that the resolution for the set of incidents may take an excessive amount of time. Hierarchical escalation is an escalation up the management chain.





Activity

1. Incident Acceptance and Recording
2. Classification and initial support
3. Matching
4. Investigation and Diagnosis
5. Resolution and Recovery
6. Closure
7. Progress monitoring and tracking



CFS

- Up-to-date Configuration Management DB
- Up-to-date knowledge base
- Adequate incident management system
- Connection to Service Level Management in order to determine the time and priority for improvement



Key Performance Indicators

- Total number of Incidents
- Mean time for service recovery
- Percentage of incidents solved in SLA
- Average cost for incident
- Number of incident per employee
- Ratio of properly classify incidents



Role

- Incident manažer
 - Monitorování celého procesu
 - Řízení podpůrných týmů
 - Zlepšování a budování IM systému
- Členové podpůrného týmů
 - Realizace činností v rámci IM procesu



Problem Management (PM)

- Reaguje na vzniklý incident, zjišťuje a odstraňuje pravou příčinu skutečného nebo potenciálního výpadku určité služby
- Zjišťuje proaktivně slabé stránky v infrastruktuře a podává návrhy na jejich odstranění
- Cílem je zabránit výskytu a znovaupakování incidentů



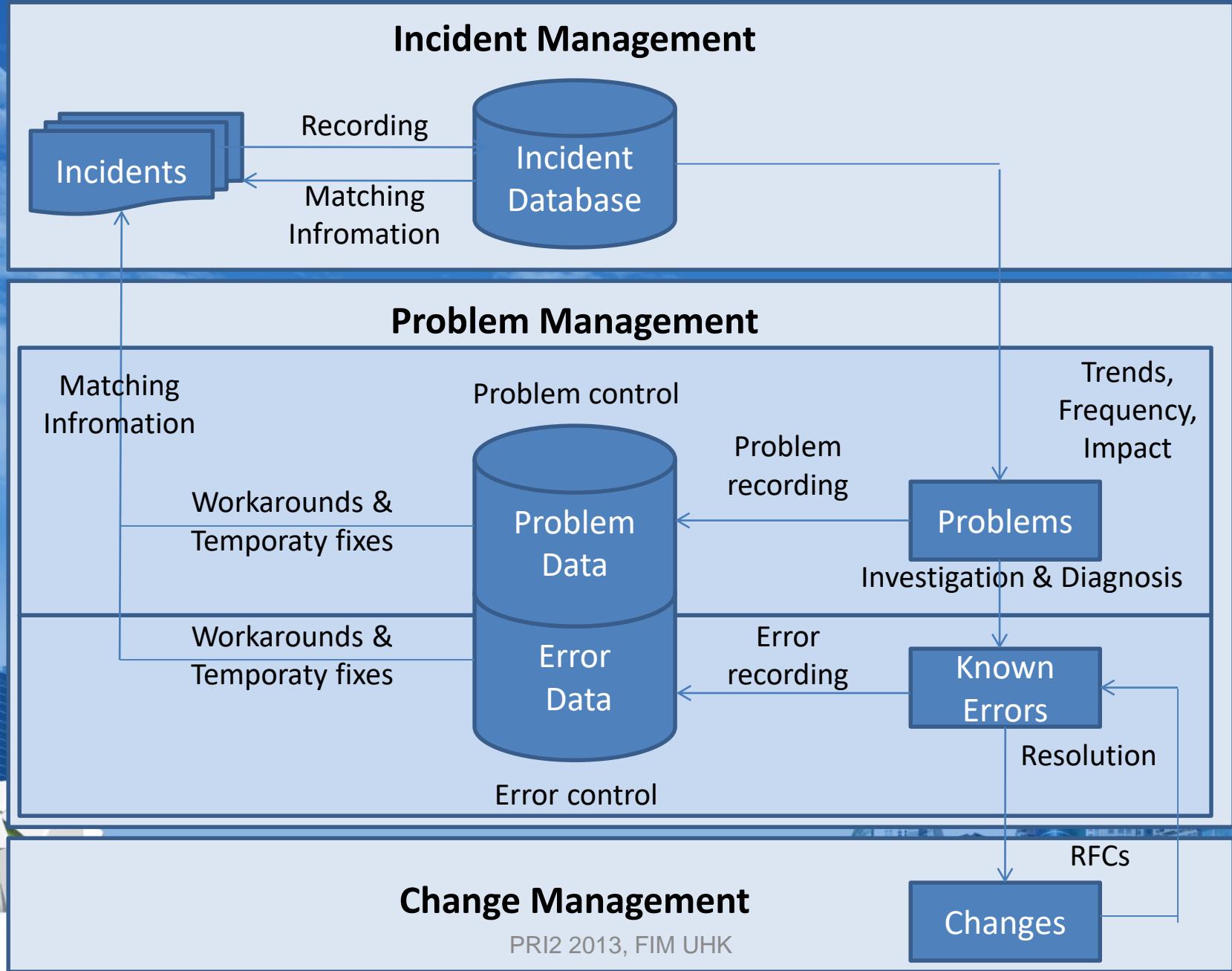
Problem, Known Error, RFC

Problem:
Unwanted state

Known Error:
Problem for which the cause is discovered

Request for Change (RFC):
Proposal to eliminate the problem

Zdroj: OGC



Reasons for PM

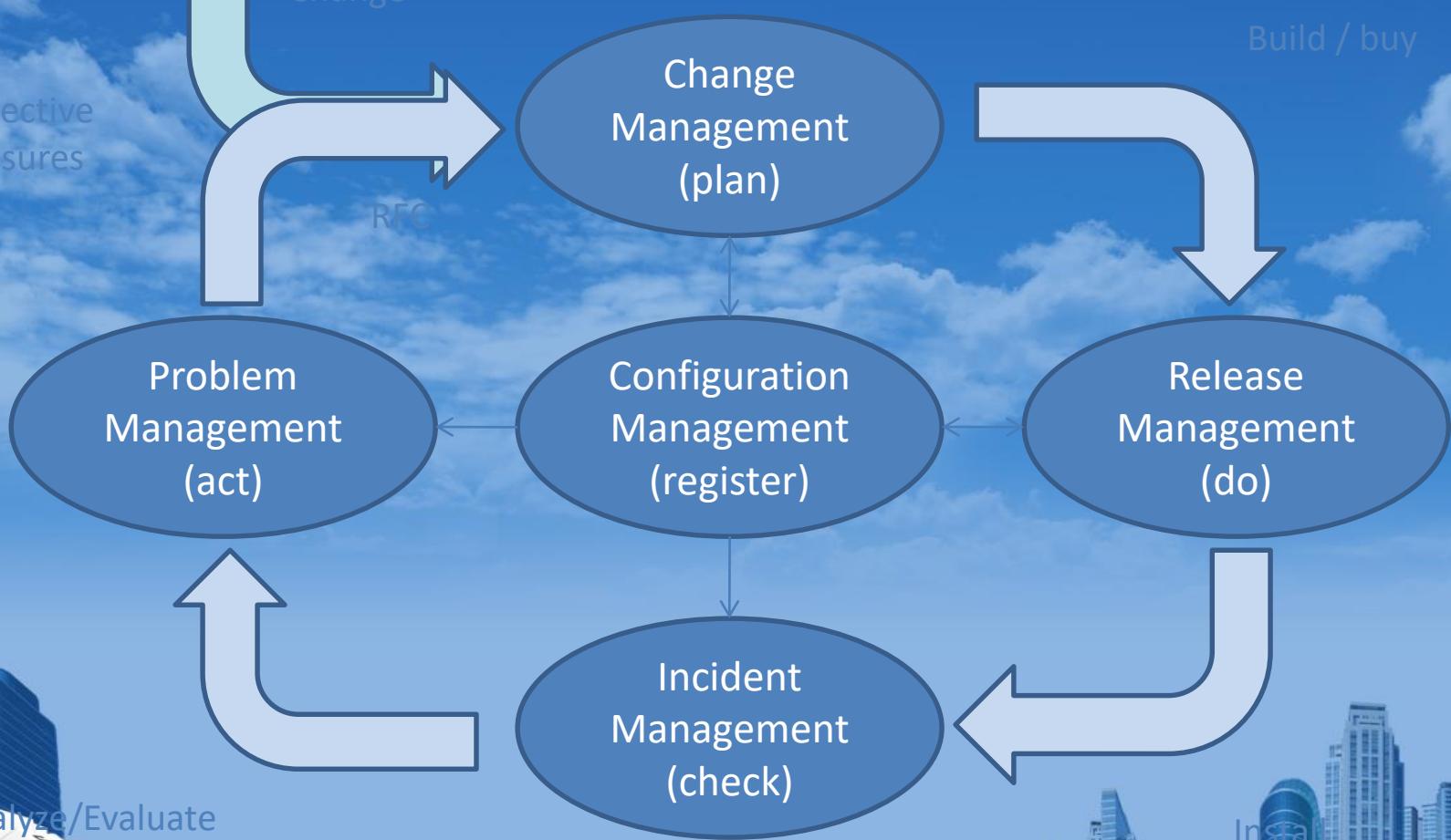
- Systematic evidence of problems and their causes
- Incidents prevention
- Reportitng the quality about infrastructure
- Capturing the operational experience and know how



Activities

- Inputs:
 - Incidents details
 - Configuration details
 - Supported service and SLA
- Activities
 - **Problem control**
 - **Error control**
 - **Proactive PM** –
 - **Reporting**
- Outputs
 - Known error database
 - Problem records
 - Solved problems





Zdroj: ITSMF

FP 2 2013, FIM UHK

Change Management

Release Management

Configuration Management

Request for Change
Filter, record and indentify

Classification & Planning
Preparing the Change

Release
The change can be implemented

Implementation
The change is built, tested and implemented

Evaluation

Closure

End

Release and distribution of new documented HW and SW

Reports and audit information

Reports

Update CI details

Update CMDB and DSL, release SW from DSL

Verify that CMDB was updated

C
M
D
B
/
D
S
L

Configuration Management

- A set of tools and databases that are used to manage an IT Service Provider's Configuration data. The CMS also includes information about Incidents, Problems, Known Errors, Changes and Releases; and may contain data about employees, Suppliers, locations, Business Units, Customers and Users. The CMS includes tools for collecting, storing, managing, updating, and presenting data about all Configuration Items and their Relationships.



Configuration Items (CI)

- CM manages so called configuration items and their mutual relations
- Configuration items – IT components and services that are provided using that components
- Examples of information about CI
 - What IT components are currently being used?
 - What IT components should be upgraded?
 - What IT components are necessary to provide a certain service?
 - What IT components are impacted by a given change?
 - What IT components cause a known error?

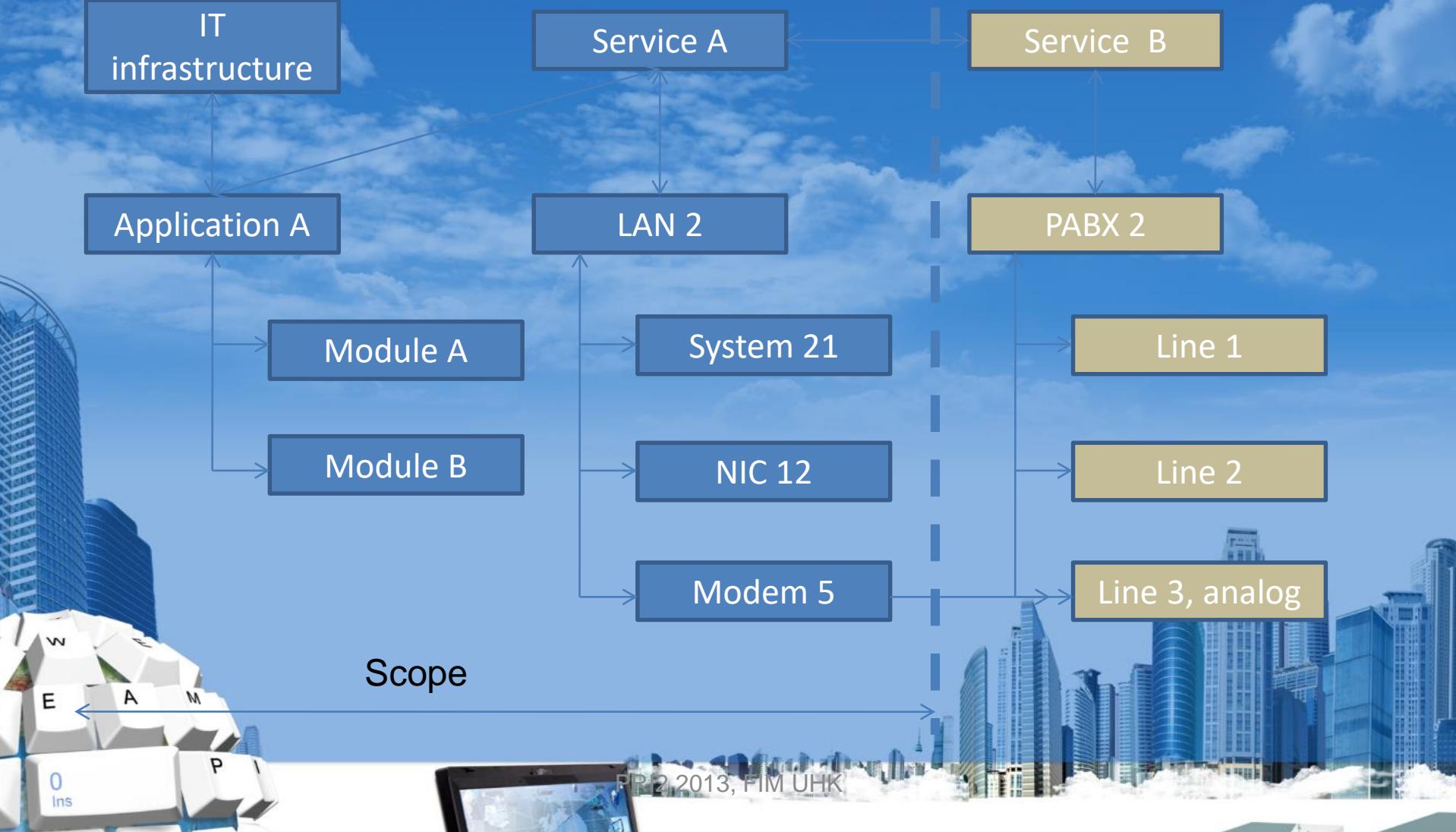


Activities

- **Planning:** The CM plan covers the next three to six months in detail, and the following twelve months in outline. Include a strategy, policy, scope, objectives, roles and responsibilities, the CM processes, activities and procedures, the CMDB, relationships with other processes and third parties.
- **Identification:** The selection, identification and labeling of all CIs which creates a parts list of every CI in the system. This includes defining the relationships of the CIs in the system.
- **Control:** This gives the assurance that only authorized and identifiable CIs are accepted and recorded from receipt to disposal. It ensures that no CI is added, modified, replaced or removed without the appropriate controlling documentation e.g. approved Requests for Change of a CI, updated specification.
- **Monitoring:** Concerned with each CI throughout its life-cycle. It enables changes to CIs and tracking of their records through various statuses, e.g. ordered, received, under test, live, under repair, withdrawn or for disposal.
- **Verification:** The reviews and audits that verify the physical existence of CIs, and checks that they are correctly recorded in the CMDB and parts list.



Scope CMDB



CFS

- Uptodate CMDB
 - Strictly following change procedures
 - Responsibility for changes
- Common terminology
- Audits



KPI

- Number of inconsistencies in CMDB and reality
- Number of unauthorized changes in configuration
- Number of cases when there is no record in CMDB
- Time necessary to process and record configuration change



Problems

- Wrong definition of scope and level of detail
- Urgent changes and fixes together with too optimistic deadlines for RFC
- Avoiding CM procedures
- Insufficient managerial support
- Insufficient CM support tools



Release and Deployment Management

- Aims to plan, schedule and control the movement of releases to test and live environments.
- The primary goal is to ensure that the integrity of the live environment is protected and that the correct components are released
- Ensures the whole project lifecycle



Reasons for RM

- Better SW quality by systematic coverage of the whole SW lifecycle
- Minimazing risk of use of incopatible versions
- Negotiated and agreed Release plan
- Better investment planning for new SW
- Ilegal copis and old version could be easier identified



Activities

- Release policy and planning
- Release design, building and configuration
- Testing and release acceptance
- Rollout planning
- Communication, preparation and training
- Release distribution and installation



Problems

- Avoiding RM procedure
- Urgent fixes
- Release of a particular version on multiple locations
- Inusfficient testing and test environment



SERVICE PLANNING



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Service Level Management

- The goal for SLM is to maintain and improve on service quality through a constant cycle of agreeing, monitoring, reporting and improving the current levels of service. It is focused on the business and maintaining the alignment between the business and IT
- Service Level Management is the process that forms the link between the IT organization and customers.



Type of documents

- **Service Level Requirements (SLR)** – is a broad statement from a customer to a service provider describing their service expectations. It includes the requirements of the customer from the service provider. A service provider then prepares the service level agreement (SLA) based on the requirements from the customer. For example: A customer may require a server be operational (uptime) for 99.95% of the year excluding maintenance..
- **Service Specification Sheet (Spec Sheet)** – builds upon the Service Level Requirements, in that it compares the requirements from the viewpoint of the client with how these requirements are actually fulfilled from a technical point of view. It is assumed that a bundle of internal IT Services is combined in order to deliver an external IT Service for the client.
- **Service Level Agreement (SLA)** – extends the service definition defining detailed service level targets, mutual responsibilities, and other requirements specific to a service provided for a certain (group of) customer(s). It focuses on the definition of requirements from a customer viewpoint.
- **Service Quality Plan (SQP)** – The Service Quality Plan contains all management information for the measurement of the IT Service quality upon the basis of Performance Indicators and the contribution by internal and external suppliers for the provision of these IT Services



Activities

- **Identifying** business requirements by working with business units
- **Establishing** the scope of services, timeliness, hours of operation, recovery aspects, and service performance
- **Translating** business requirements into IT requirements
- **Developing** and **maintaining** a service catalog, including costs for different tiers of service performance
- **Performing** gap analysis between business requirements and available services.
- **Determining** the costs related to services such that service goals satisfy business needs at a price the business can afford
- **Drafting, negotiating and refining** SLAs with the business units, ensuring business requirements are met and agreement from all parties involved
- **Implementing** SLAs
- **Measuring** SLA performance, reporting results and adjusting as necessary



Problems

- Service orientation requires change in attitude
- Customer is often not able to define requirements for Service Level Requirements
- Difficult to define customer expectation in measureable terms
- Underestimating the cost of monitoring services delivered
- Preparing SLA without understanding the customer needs



Service Portfolio Scorecard

- Tool for monitoring the services and their basic characteristics
- Characteristics
 - ROI (%) ... Line X
 - Business Alignment ... Line Y
 - Business Utilization ... point size
 - Business Performance ... point color
- Performance levels: Critical, very poor, poor, acceptable, good, very good.





Capacity Management

- ensure that the capacity of IT services and the IT infrastructure is able to deliver the agreed service level targets in a cost effective and timely manner.
- considers all resources required to deliver the IT service, and plans for short, medium and long term business requirements
- plans changes in performance based on RFC from Change Management



Subprocesses

- **Business Capacity Management** – proactive analysis of current and future needs based on the strategies, trends and customer requirements
- **Service Capacity Management** – analyses performance balancing of the IT services; it is connected with Service Level Management in negotiating the agreement parameters
- **Resource Capacity Management** – deals with capacities of individual IT resources (e.g. Network performance, processor time use, disk usage, etc.)



Activities

- **Monitoring, analyzing, tuning, and implementing** necessary changes in resource utilization
- **Managing demand** for computing resources, which requires an understanding of business priorities
- **Modeling to simulate** infrastructure performance and understand future resource needs
- **Application sizing** to ensure required service levels can be met
- **Storing** capacity management data
- **Producing** a capacity plan that documents current utilization and forecasted requirements, as well as support costs for new applications or releases
- Building the annual infrastructure growth plan with input from other teams



Capacity Plan

- A Capacity Plan is used to manage the resources required to deliver IT services.
- The plan contains scenarios for different predictions of business demand, and costed options to deliver the agreed service level targets



KPI

- **Predictable demand** – possibility to define future capacity requirements
- **Technology** – possibility to measure performance and ability to achieve levels given in SLA
- **Cost** – decrease in unplanned investments
decrease in unmanaged IT capacities
- **Operation** – decrease in the number of incidents connected with insufficient capacities





MOF

Microsoft Operations Framework (MOF)

- consists of integrated best practices, principles, and activities that provide comprehensive guidelines for achieving reliability for IT solutions and services.
- encompasses all of the activities and processes involved in managing an IT service: its conception, development, operation, maintenance, and—ultimately—its retirement.



Goal of MOF

- is to provide guidance to IT organizations to help them create, operate, and support IT services while ensuring that the investment in IT delivers expected business value at an acceptable level of risk
- is to create an environment where business and IT can work together toward operational maturity, using a proactive model that defines processes and standard procedures to gain efficiency and effectiveness.

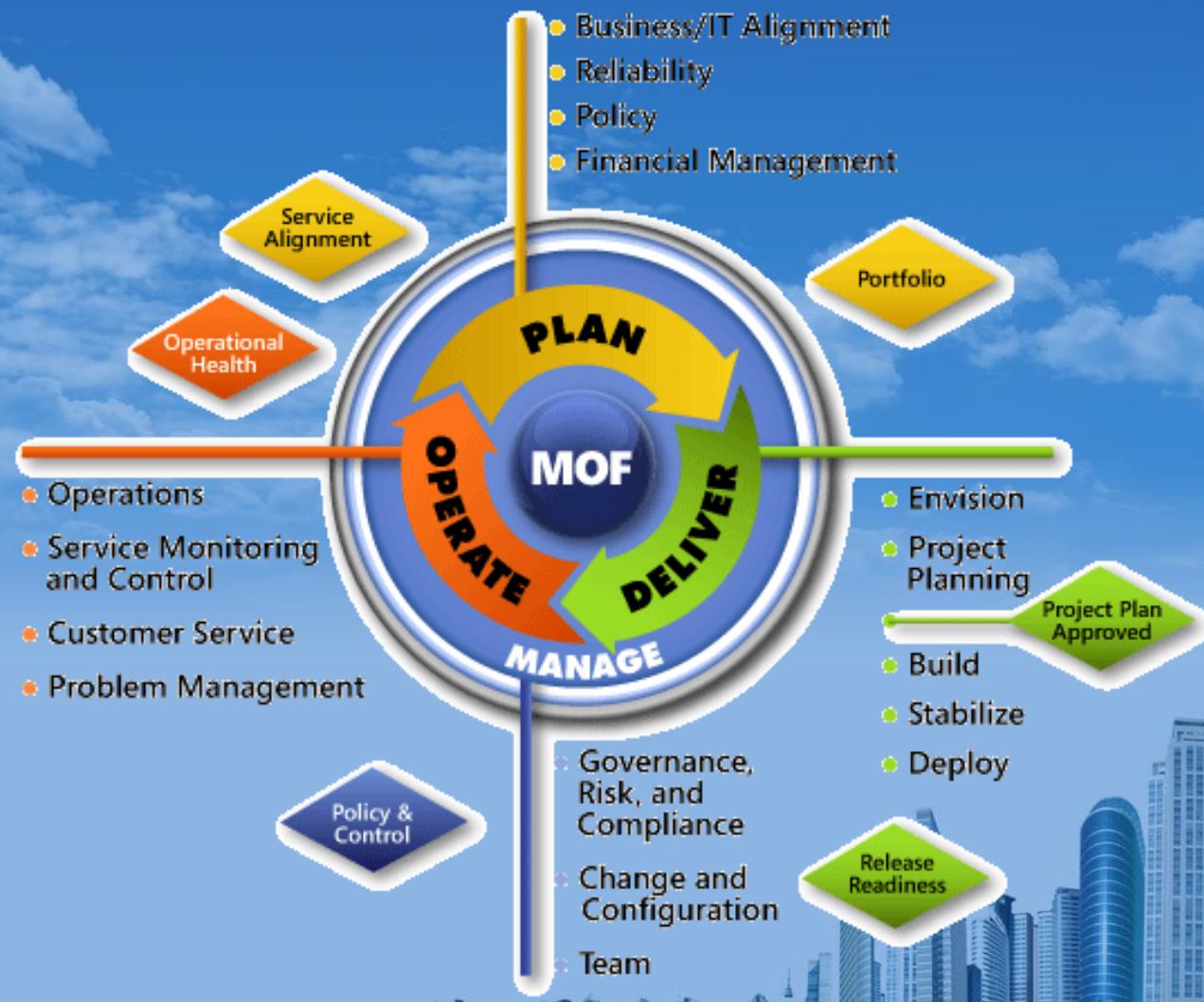


Life cycle phases

- The Plan Phase.
- The Deliver Phase.
- The Operate Phase.
- The Manage Layer.



MOF lifecycle phases



Service Management Functions

- Each phase of the IT service lifecycle contains service management functions (SMFs) that define the processes, people, and activities required to align IT services to the requirements of the business.



Management Reviews

- For each phase in the lifecycle, management reviews (MRs) serve to bring together information and people to determine the status of IT services and to establish readiness to move forward in the lifecycle.
- MRs are internal controls that provide management validation checks, ensuring that goals are being achieved in an appropriate fashion, and that business value is considered throughout the IT service lifecycle.



The goals of management reviews

- Provide management oversight and guidance.
- Act as internal controls at the phase level of the IT lifecycle.
- Assess the state of activities and prevent premature advancement into the next phases.
- Capture organizational learning.
- Improve processes.



Root Cause Analysis Techniques

- A difficult area of Problem Management for most organizations is analyzing the root cause of a problem. Root cause analysis techniques are used to identify the conditions that initiate an undesired activity or state. Since problems are best solved by attempting to correct or eliminate their root causes, this is a critical part of resolving any problem.
- There are many techniques available for performing root cause analysis. Two of the most popular are:
 - Fishbone diagrams.
 - Fault tree analysis.

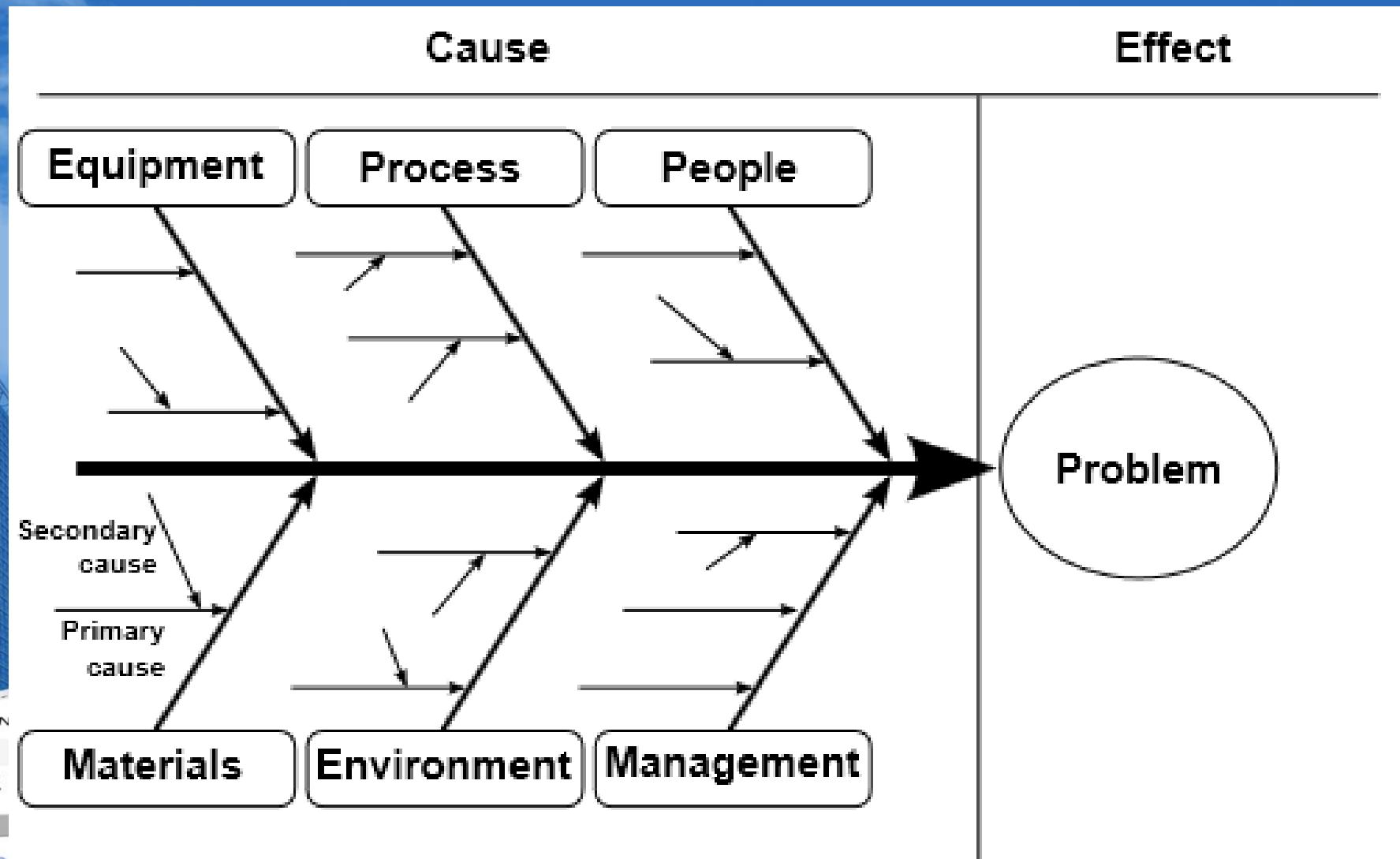


Fishbone Diagrams

- Visual techniques are often used to assist IT professionals to determine the root cause of a problem. One tool useful in visually diagramming the process is the Ishikawa, or fishbone, diagram.



Fishbone diagram example



The 8 Ps (used in service industry)

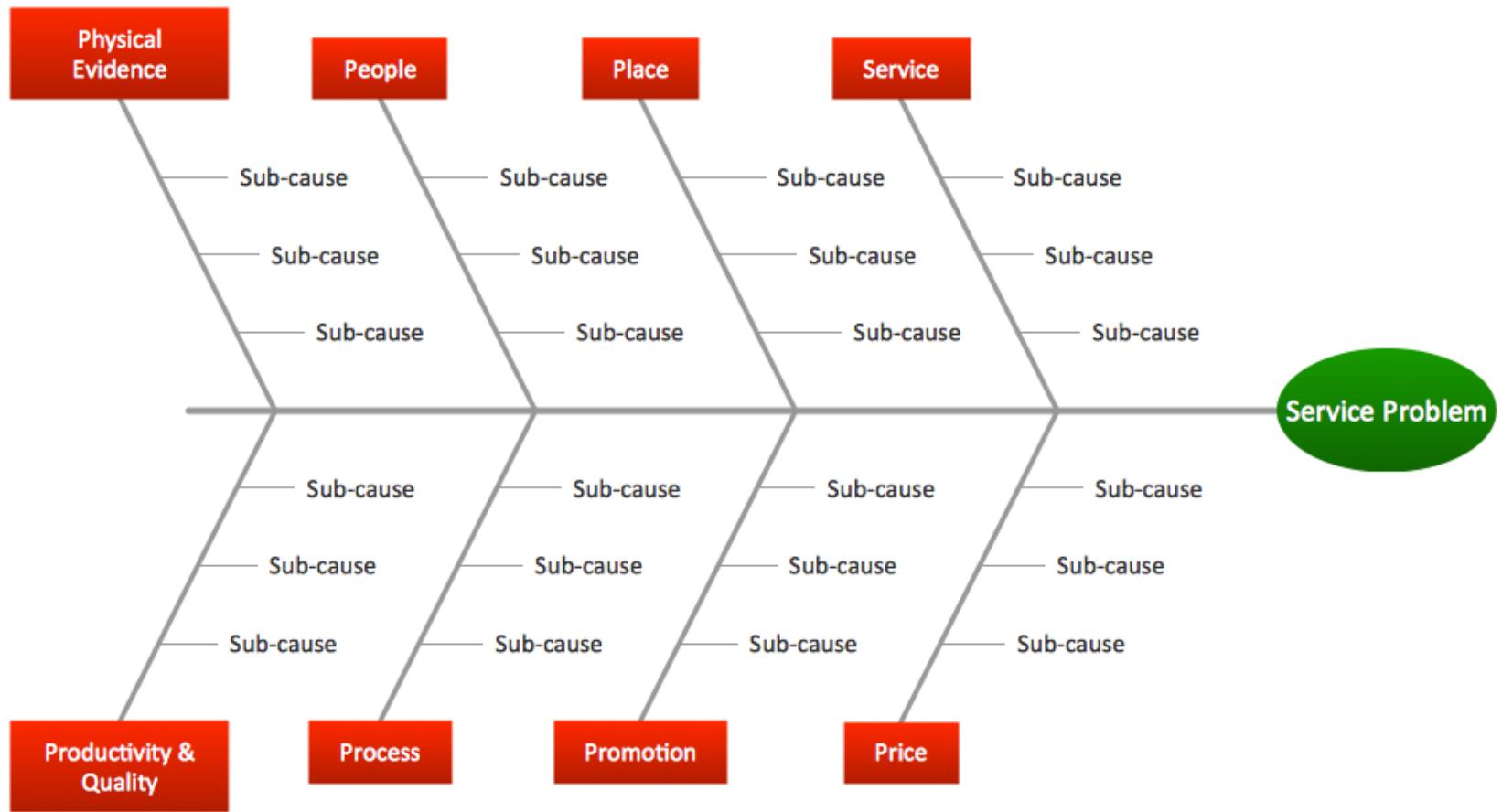


Diagram creation

1. Formulate the problem (unwanted state)
head
2. Brainstorm any potential cause
3. Categorize the causes (conceptual modeling,
affinity process)
4. Diagram completion
5. Interpretation and further analyses (Pareto
chart)



Fault Tree Analysis

- Fault tree analysis is another visual technique used to assist with root cause analysis. It is a top-down approach to identifying all potential causes leading to a defect. In the final stage of diagnosis, the root cause is identified and the problem is moved from an unknown state to a known state. The following figure shows an example of fault tree analysis.

Fault Tree Analysis example

Level 1

*Windows Vista Desktop is
unable to achieve remote access
connectivity to the Woodgrove
Bank Corp. Network*

Level 2

Security

Network

Level 3

*Latest
updates
are not
installed*

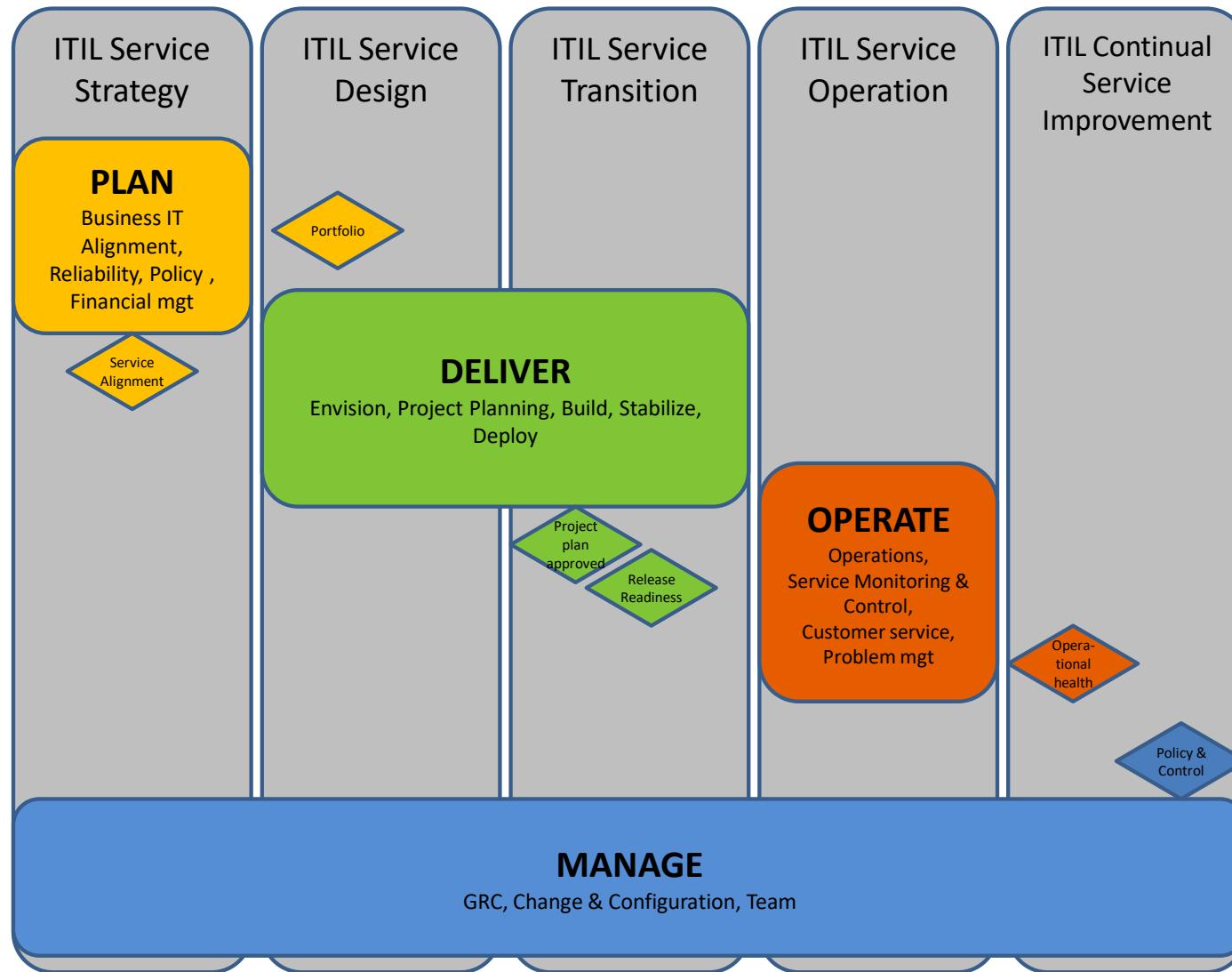
*Antivirus
not updated*

*VPN is not
accepting
any
connections*

*Incorrect
user name
or password*

*General
network
failure*

Differences MOF and ITIL





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COBIT



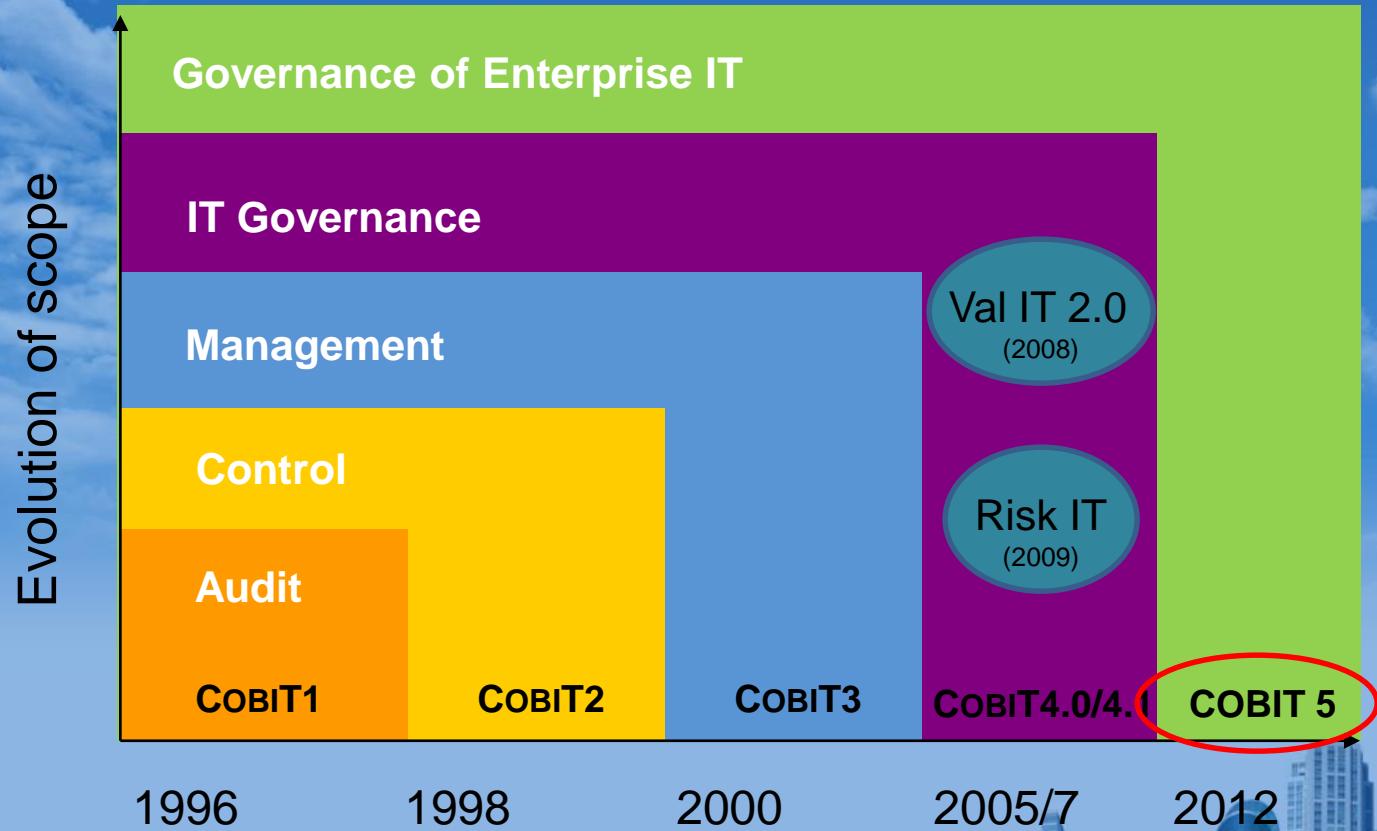
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COBIT

- COBIT (Control Objectives for Information and related Technology) developed by Systems Audit and Control Association (ISACA) and IT Governance Institute (ITGI) in 1996
- Business framework for the governance and management of enterprise IT. It provides globally accepted principles, practices, analytical tools and models to help increase the trust in, and value from, information systems.



COBIT 5: Now One Complete Business Framework for

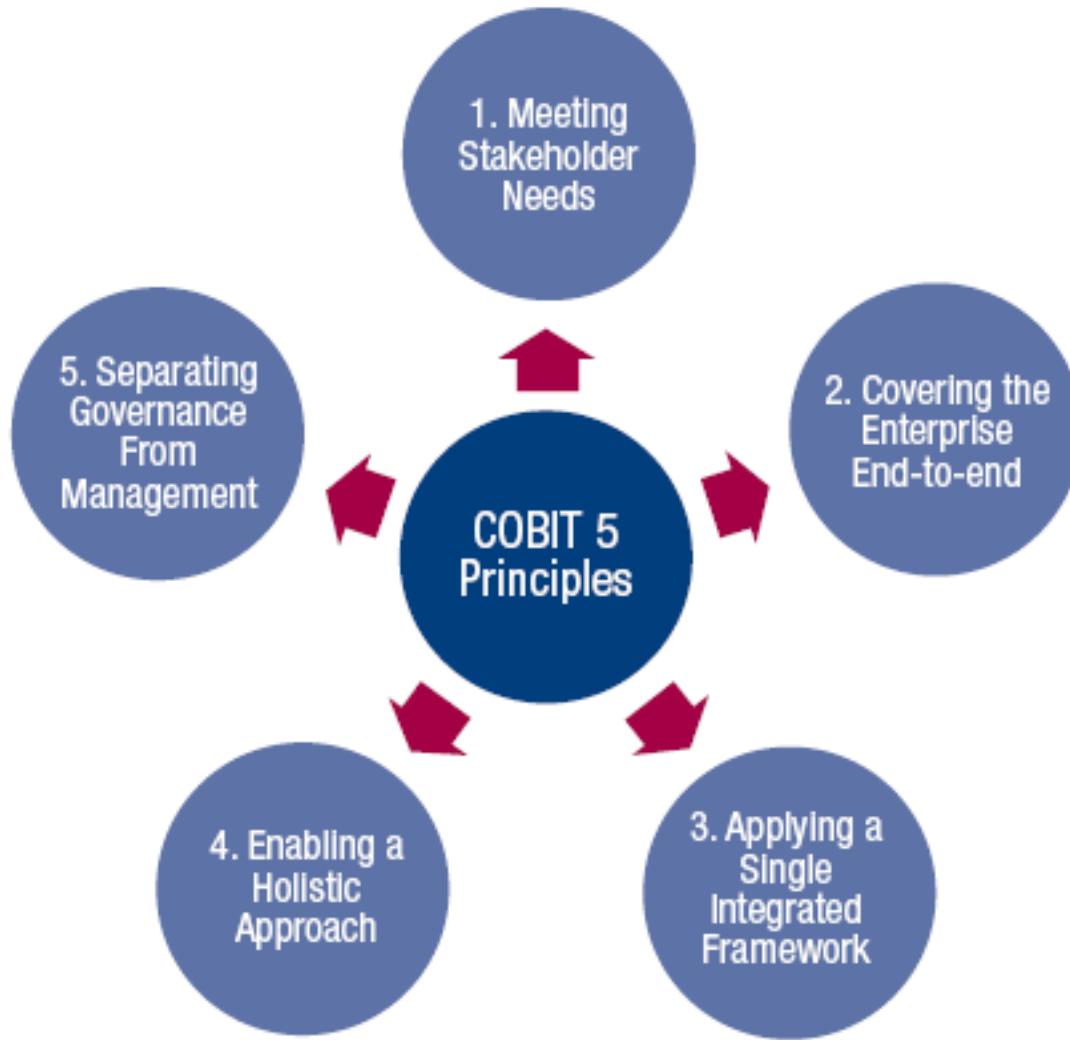


An business framework from ISACA, at www.isaca.org/cobit

COBIT 5 principles

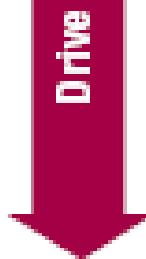
- Meeting Stakeholder Needs
- Covering the Enterprise End-to-end
- Applying a Single Integrated Framework
- Enabling a Holistic Approach
- Separating Governance from Management

Basic principles





**Stakeholder
Needs**

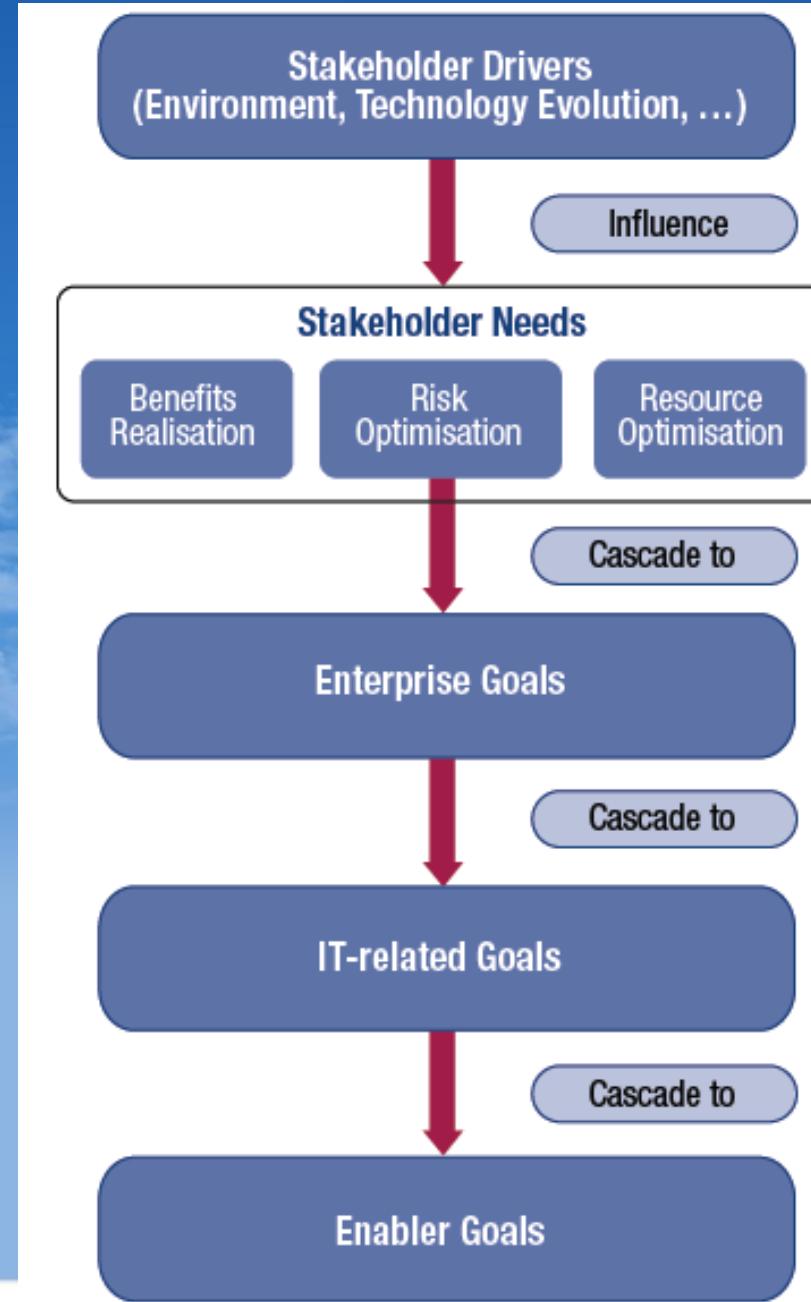


Governance Objective: Value Creation

**Benefits
Realisation**

**Risk
Optimisation**

**Resource
Optimisation**



Enterprise goals

Figure 5—COBIT 5 Enterprise Goals

BSC Dimension	Enterprise Goal	Relation to Governance Objectives		
		Benefits Realisation	Risk Optimisation	Resource Optimisation
Financial	1. Stakeholder value of business investments	P		S
	2. Portfolio of competitive products and services	P	P	S
	3. Managed business risk (safeguarding of assets)		P	S
	4. Compliance with external laws and regulations		P	
	5. Financial transparency	P	S	S
Customer	6. Customer-oriented service culture	P		S
	7. Business service continuity and availability		P	
	8. Agile responses to a changing business environment	P		S
	9. Information-based strategic decision making	P	P	P
	10. Optimisation of service delivery costs	P		P
Internal	11. Optimisation of business process functionality	P		P
	12. Optimisation of business process costs	P		P
	13. Managed business change programmes	P	P	S
	14. Operational and staff productivity	P		P
	15. Compliance with internal policies		P	
Learning and Growth	16. Skilled and motivated people	S	P	P
	17. Product and business innovation culture	P		

IT goals

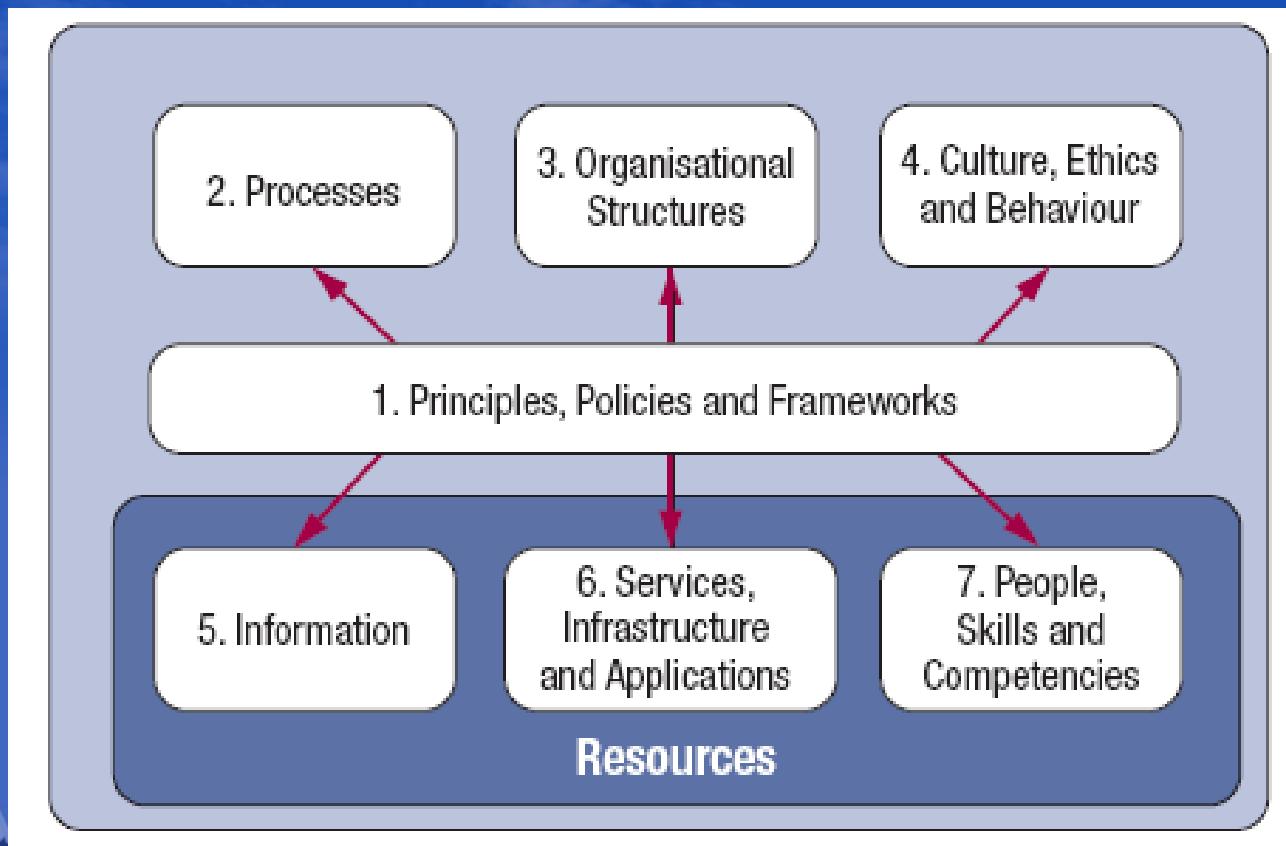
Figure 6—IT-related Goals

IT BSC Dimension	Information and Related Technology Goal	
Financial	01	Alignment of IT and business strategy
	02	IT compliance and support for business compliance with external laws and regulations
	03	Commitment of executive management for making IT-related decisions
	04	Managed IT-related business risk
	05	Realised benefits from IT-enabled investments and services portfolio
	06	Transparency of IT costs, benefits and risk
Customer	07	Delivery of IT services in line with business requirements
	08	Adequate use of applications, information and technology solutions
Internal	09	IT agility
	10	Security of information, processing infrastructure and applications
	11	Optimisation of IT assets, resources and capabilities
	12	Enablement and support of business processes by integrating applications and technology into business processes
	13	Delivery of programmes delivering benefits, on time, on budget, and meeting requirements and quality standards
	14	Availability of reliable and useful information for decision making
	15	IT compliance with internal policies
Learning and Growth	16	Competent and motivated business and IT personnel
	17	Knowledge, expertise and initiatives for business innovation

Figure 22—Mapping COBIT 5 Enterprise Goals to IT-related Goals

Enabling a Holistic Approach

Using so called enablers



Dimensions

Enabler Dimension

Stakeholders

- Internal Stakeholders
- External Stakeholders

Goals

- Intrinsic Quality
- Contextual Quality (Relevance, Effectiveness)
- Accessibility and Security

Life Cycle

- Plan
- Design
- Build/Acquire/Create/Implement
- Use/Operate
- Evaluate/Monitor
- Update/Dispose

Good Practices

- Practices
- Work Products (Inputs/Outputs)

Enabler Performance Management

Are Stakeholders Needs Addressed?

Are Enabler Goals Achieved?

Is Life Cycle Managed?

Are Good Practices Applied?

Metrics for Achievement of Goals
(Lag Indicators)

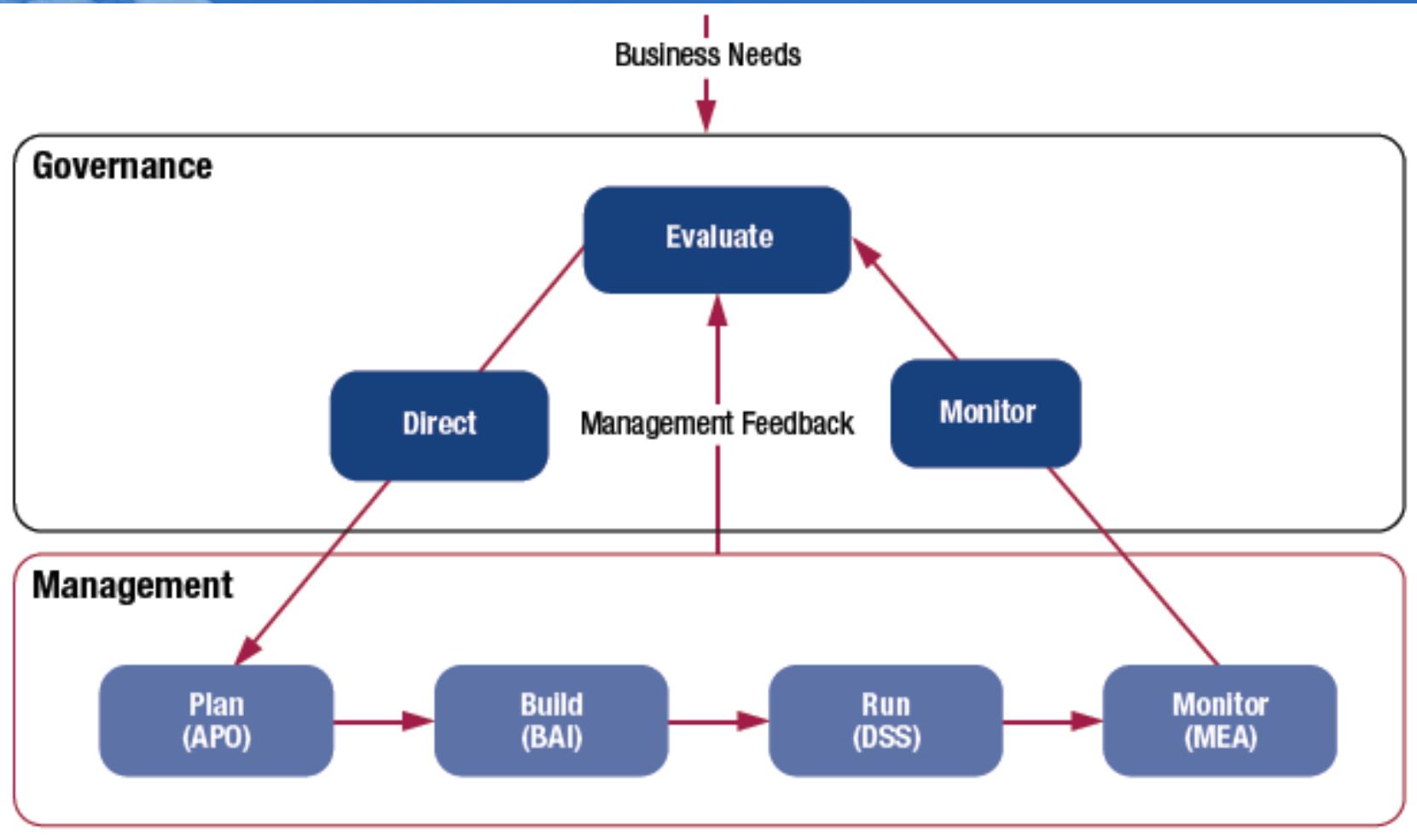
Metrics for Application of Practice
(Lead Indicators)

- you can understand the enabler as a key information (see information as one of the dimensions). A particular example would be a recipe(s) for cooking pizza. What you should do is to list
 - - stakeholders for example producer, consumer, someone who maintains that information.
 - - list the goals that you would want to achieve to properly utilize the enabler for instance how to secure the information or what should be the quality.
 - - life cycle of the information – elaborate phases
 - - best practices – how to work with that information and what proves good and wrong.
-
- The enable does not have to be only information but also process, cultural habit



Governance and Management

- **Governance** ensures that enterprise objectives are achieved by **evaluating** stakeholder needs, conditions and options; setting **direction** through prioritisation and decision making; and **monitoring** performance, compliance and progress against agreed-on direction and objectives (**EDM**).
- **Management** **plans**, **builds**, **runs** and **monitors** activities in alignment with the direction set by the governance body to achieve the enterprise objectives (**PBRM**).



Evaluate, Direct and Monitor

EDM01 Ensure Governance Framework Setting and Maintenance

EDM02 Ensure Benefits Delivery

EDM03 Ensure Risk Optimisation

EDM04 Ensure Resource Optimisation

EDM05 Ensure Stakeholder Transparency

Align, Plan and Organise

AP001 Manage the IT Management Framework

AP002 Manage Strategy

AP003 Manage Enterprise Architecture

AP004 Manage Innovation

AP005 Manage Portfolio

AP006 Manage Budget and Costs

AP007 Manage Human Resources

AP008 Manage Relationships

AP009 Manage Service Agreements

AP010 Manage Suppliers

AP011 Manage Quality

AP012 Manage Risk

AP013 Manage Security

Monitor, Evaluate and Assess

MEA01 Monitor, Evaluate and Assess Performance and Conformance

Build, Acquire and Implement

BAI01 Manage Programmes and Projects

BAI02 Manage Requirements Definition

BAI03 Manage Solutions Identification and Build

BAI04 Manage Availability and Capacity

BAI05 Manage Organisational Change Enablement

BAI06 Manage Changes

BAI07 Manage Change Acceptance and Transitioning

BAI08 Manage Knowledge

BAI09 Manage Assets

BAI10 Manage Configuration

MEA02 Monitor, Evaluate and Assess the System of Internal Control

Deliver, Service and Support

DSS01 Manage Operations

DSS02 Manage Service Requests and Incidents

DSS03 Manage Problems

DSS04 Manage Continuity

DSS05 Manage Security Services

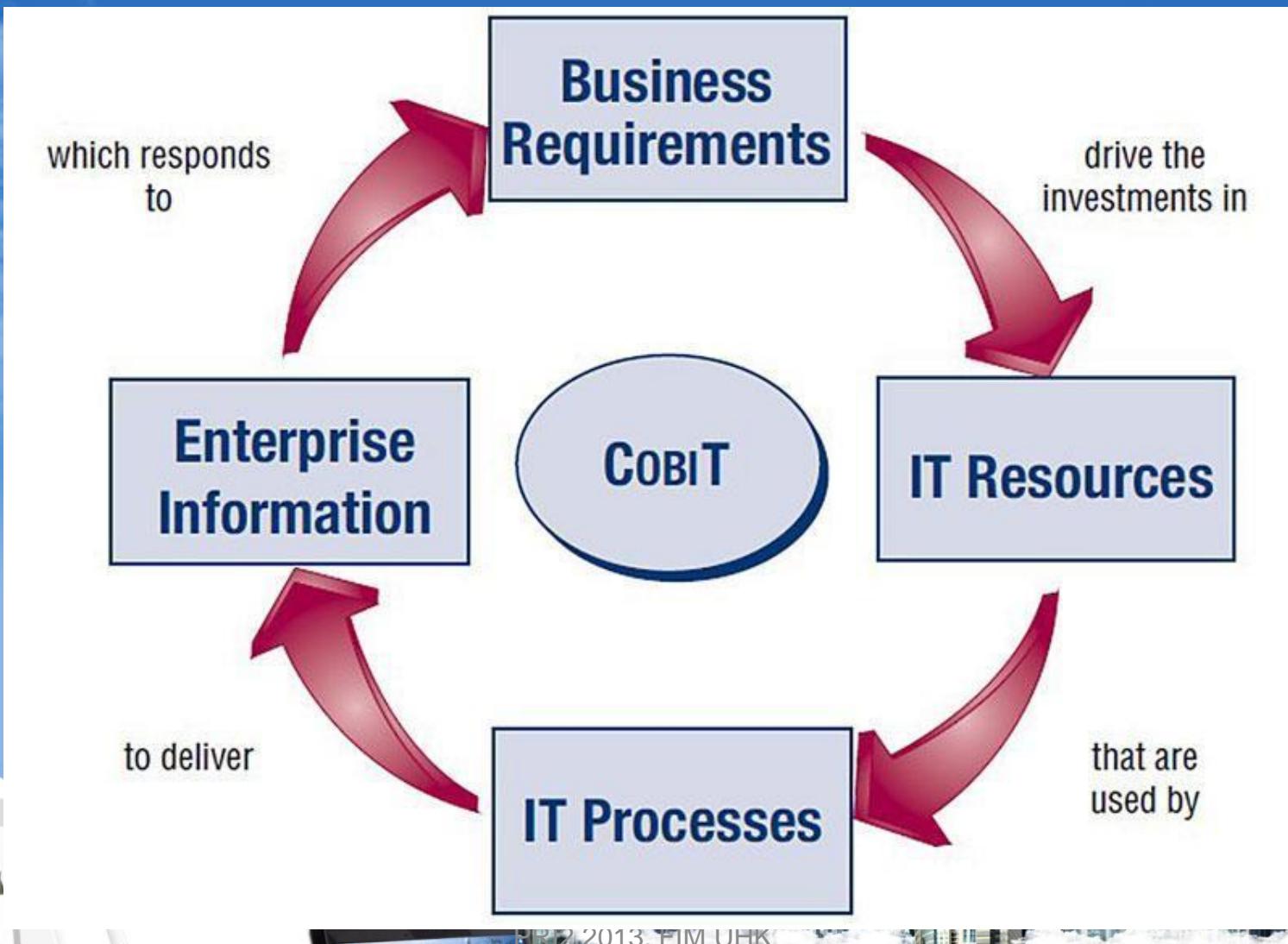
DSS06 Manage Business Process Controls

MEA03 Monitor, Evaluate and Assess Compliance With External Requirements

Processes for Management of Enterprise IT



Základní východiska COBIT

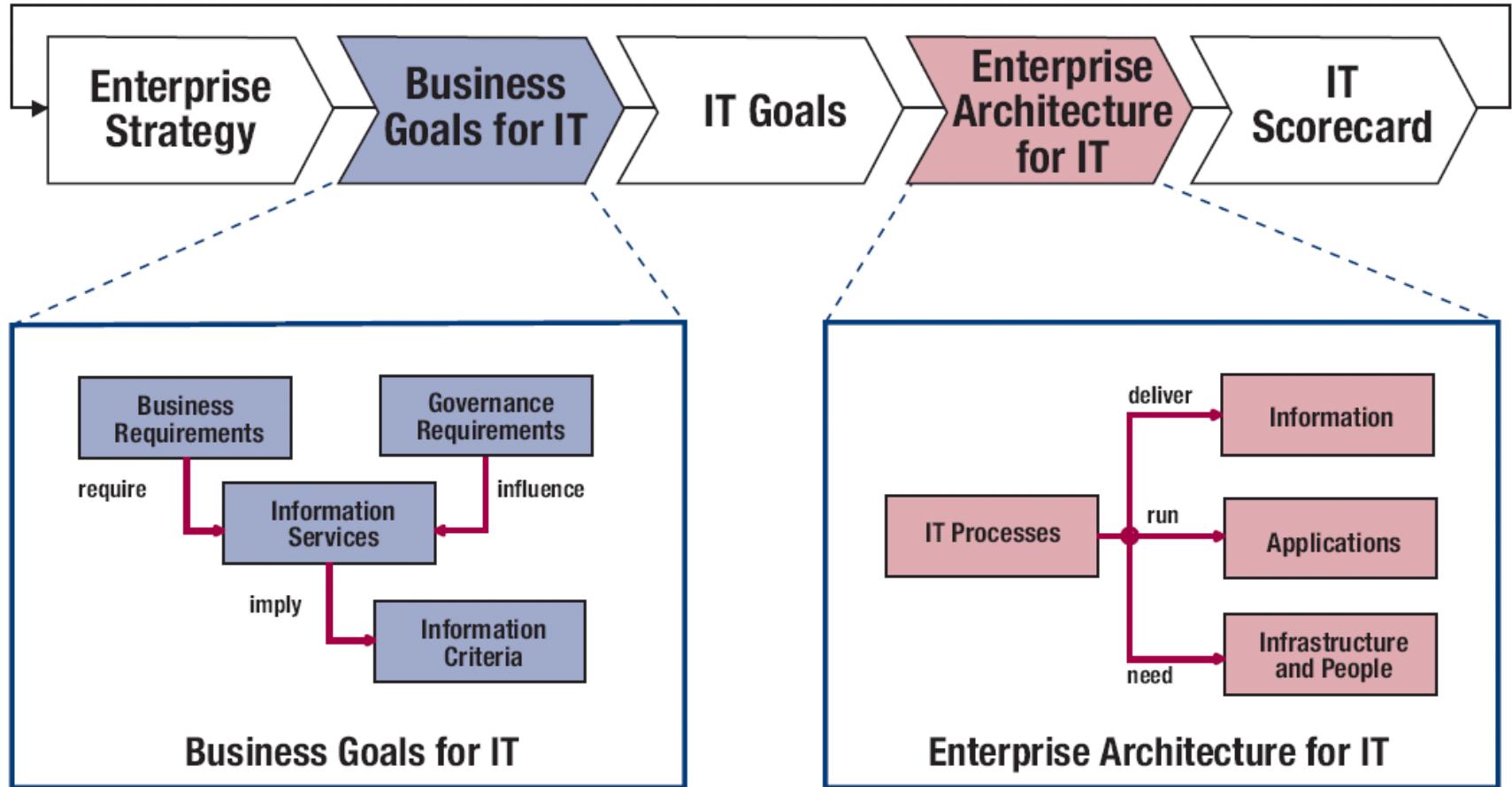


Kritéria posouzení informací

- **Účelnost** – vhodnost a relevantnost informací včetně správného načasování, konzistence a odpovídající využitelnosti
- **Hospodárnost** – řeší optimalizaci zdrojů při zajištění informací
- **Důvěryhodnost** – zabývá se ochranou informací proti neoprávněnému využití
- **Integrita** – vztahuje se na přesnost, úplnost a také platnost s ohledem na definované požadavky
- **Dostupnost** – řeší dostupnost informací v potřebném čase včetně zajištění potřebných kapacit zdrojů
- **Soulad** – s principy, pravidly a přijatými ujednáními; interními i externími předpisy
- **Spolehlivost** – tak, aby management mohl vykonávat svou činnost



Provázanost firemních a IT cílů



IT zdroje

- Cíle jsou dosahovány zapojením IT zdrojů (IT infrastruktury a schopností lidí) do procesů
- Zdroje včetně odpovídajících procesů tvoří tzv. podnikovou IT architektru (Enterprise Architecture for IT)
- Firma musí investovat do IT zdrojů pro dosažení odpovídající technické způsobilosti. Technická způsobilost podporuje firemní způsobilost jež vede k naplnění cílů (např. zvýšení prodejů)



IT zdroje identifikované v rámci COBIT

- **Aplikace** – automatizují manuální činnosti a zpracovávají informace
- **Informace** – data a údaje v jakékoli podobě včetně výstupů z informačních systémů v jakékoli podobě využitelné pro dosažení firemních cílů
- **Infrastruktura** – veškeré technologické vybavení potřebné pro chod aplikací
- **Lidé** – pracovníci provádějící plánování, organizaci, implementaci, podporu, monitorování a vyhodnocení informačních systémů a IT služeb.



Procesní model v COBIT

- COBIT definuje IT činnosti v procesním modelu rozděleném na 4 domény (vymezené také jako odpovědnosti)
- Domény:
 - **Plan and Organize (PO)** – vymezuje kroky k naplnění řešení AI a dodávky služeb DS
 - **Acquire and Implement (AI)** – naplnění řešení v podobě dodávky služeb
 - **Deliver and Support (DS)** – předání řešení k používání
 - **Monitor and Evaluate (ME)** – sledování aktivit tak, aby došlo k naplnění kroků vymezených v PO
- V rámci uvedených domén je vymezeno 34 procesů



Zaměření na výstupy/Control based

- Vymezuje tzv. „Control Objectives“
- „Control Objectives“ :
 - Jsou deklarace manažerských aktivit vedoucích ke zvýšení hodnoty a snížení rizik
 - Skládají se z pravidel, principů, praktik a organizačního uspořádání
 - Slouží k poskytování přiměřené záruky, že cíle budou naplněny a že dojde k prevenci nepříznivých událostí a vlivů
- Každý COBIT proces má navíc tzv. „Generic Control Requirements“



Generic Control Requirements

- **PC1 Process Goals and Objectives** – jasně definované cíle SMARRT
- **PC2 Process Ownership** – stanovuje vlastníka a vymezuje roli a odpovědnosti vlastníka procesu
- **PC3 Process Repeatability** – nastavení aktivit, aby bylo opakovaně dosahováno odpovídajícího výstupu i při potřebě zvýšení výkonu nebo neočekávaných událostí
- **PC4 Roles and Responsibilities** – definování klíčových aktivit a finálního výstupu procesu včetně odpovědností za odpovídající provádění
- **PC5 Policy, Plans and Procedures** – vymezuje jak mají být procesy dokumentovány, revidovány, schvalovány a komunikovány
- **PC6 Process Performance Improvement** – definuje ukazatele pro sledování výkonnosti a posuzování výstupu



Důraz na sledování a porovnávání

- Základní otázky: *Co má být měřeno a jak?* a *Jak určit odpovídající úroveň výkonu?*
- COBIT vymezuje
 - **Modely zralosti** (Maturity models) – umožňují srovnání a prostoru pro zlepšení
 - **Výkonností cíle a ukazatele** – pro sledování naplnění cílů; vychází se z principů balanced scorecard



Modely zralosti

- Řeší odpovědi na :
 - Jakou výkonnost mají srovnatelné podniky a na jaké úrovni je daná firma v porovnání?
 - Jaké jsou odpovídající průmyslové standardy a jak jsou využívány v dané firmě?
 - Dělá daná firma hodně nebo málo?
 - Jak identifikovat činnosti, které nás dostanou na srovnatelnou úroveň s ostatními podniky?



Hodnocení zralosti procesů

- Odvozeno od modelu zralosti procesů tzv. Capability Maturity Modelu vytvořených Software Engineering Institute (SEI)
- V COBIT však zaměřeno na měření zralosti 34 uvedených procesů
- Úrovně
 - 0 - neexistující řízení: Procesy a jejich řízení je zcela chaotické
 - 1 - Počáteční (Initial): Procesy jsou realizovány adhoc
 - 2 - Opakování (Repeatable): Dodržuje se určitá kázeň, nezbytná pro provádění základních opakovacích procesů.
 - 3 - Definovaná (Defined): Procesy organizace jsou zdokumentovány
 - 4 - Řízení (Managed): Procesy jsou řízeny a provádí se měření jejich výkonnosti pomocí KPI
 - 5 - Optimalizovaná (optimized): Procesy jsou trvale zlepšovány, existuje inovační cyklus na procesech a řízení.



Rozdíl ITIL a COBIT

- ITIL definuje co za procesy je třeba vytvořit, aby byla zajištěna odpovídající dodávka IT služeb
- COBIT je základní rámec pro IT Governance a vymezuje pravidla, principy pro sjednocení firemních a IT cílů. Zároveň předkládá postupy měření, kontrolní mechanismy a ukazatele pro určení, zda jsou definované cíle řádně naplňovány.



TOGAF



FIR 2013, FIM UHK

What is TOGAF?

- TOGAF is an architecture framework – The Open Group Architecture Framework.
- TOGAF provides the methods and tools for assisting in the acceptance, production, use, and maintenance of an enterprise architecture. It is based on an iterative process model supported by best practices and a re-usable set of existing architecture assets.



Enterprise Architecture

- ISO/IEC 42010: 2007 defines “architecture” as:
“The fundamental organization of a system, embodied in its components, their relationships to each other and the environment, and the principles governing its design and evolution.”
- In TOGAF, ‘architecture’ has two meanings
 - A formal description of a system, or a detailed plan of the system at component level to guide its implementation
 - The structure of components, their inter-relationships, and the principles and guidelines governing their design and evolution over time

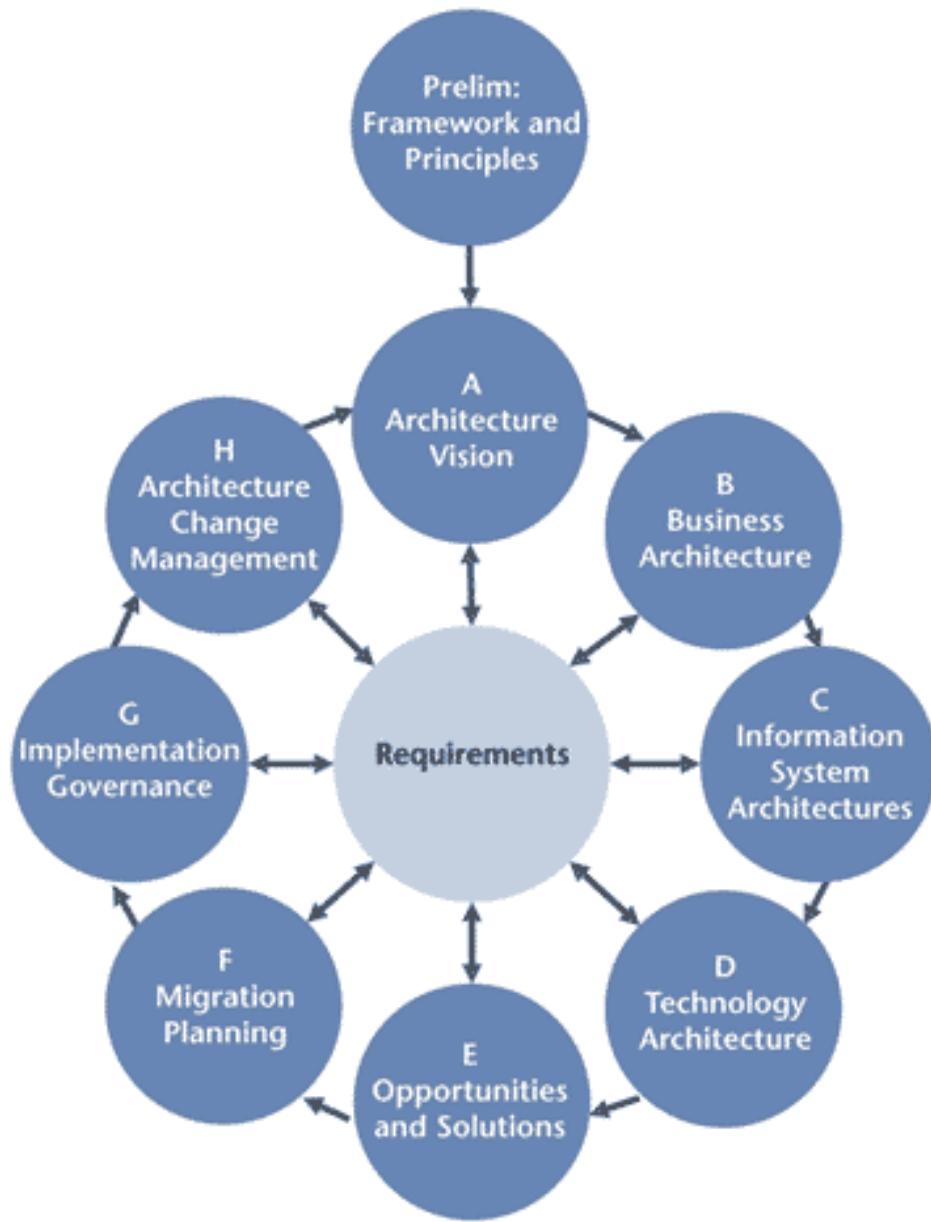


Architecture domains

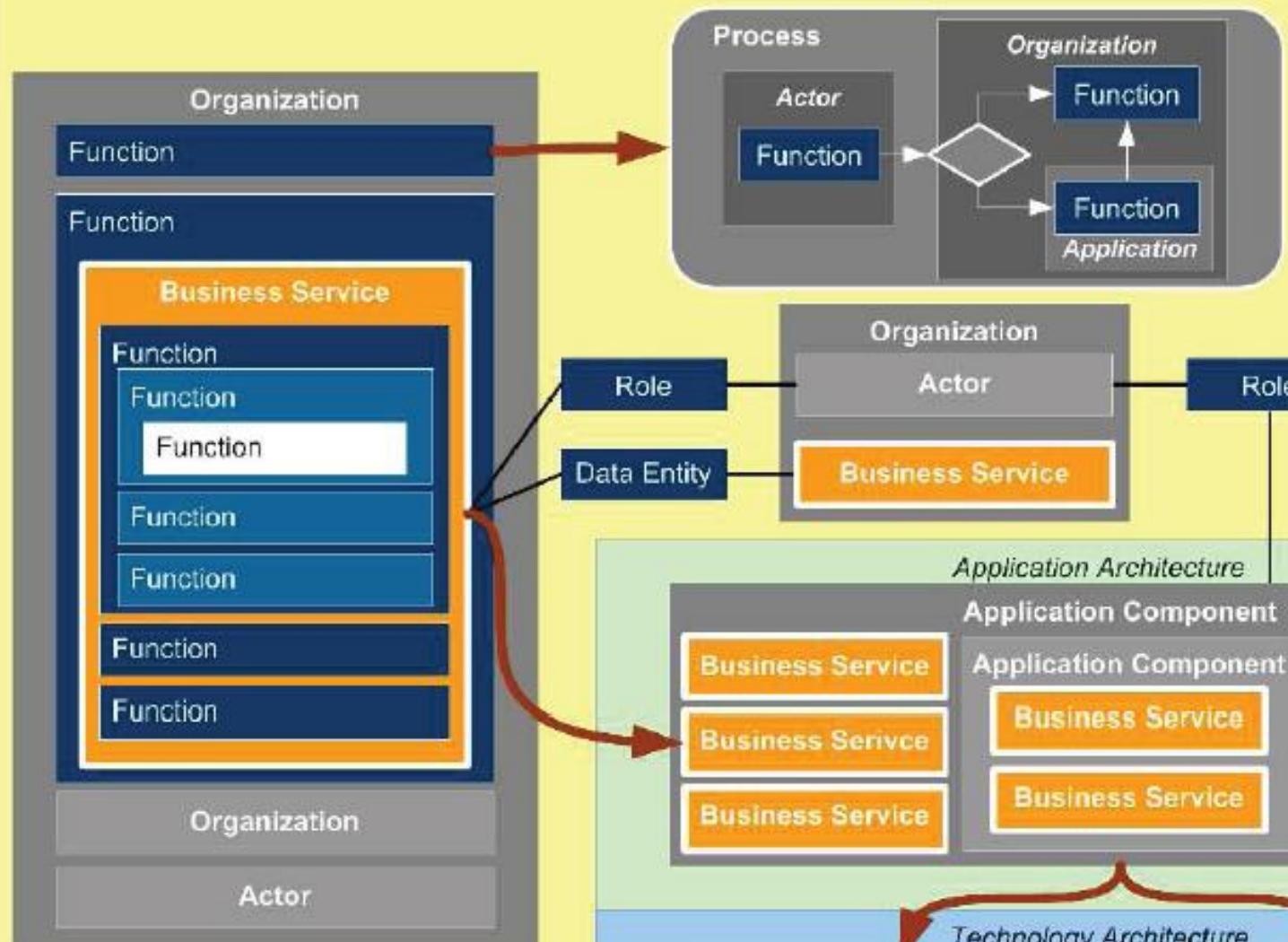
- The **Business Architecture** defines the business strategy, governance, organization, and key business processes.
- The **Data Architecture** describes the structure of an organization's logical and physical data assets and data management resources.
- The **Application Architecture** provides a blueprint for the individual application systems to be deployed, their interactions, and their relationships to the core business processes of the organization.
- The **Technology Architecture** describes the logical software and hardware capabilities that are required to support the deployment of business, data, and application services. This includes IT infrastructure, middleware, networks, communications, processing, standards, etc.



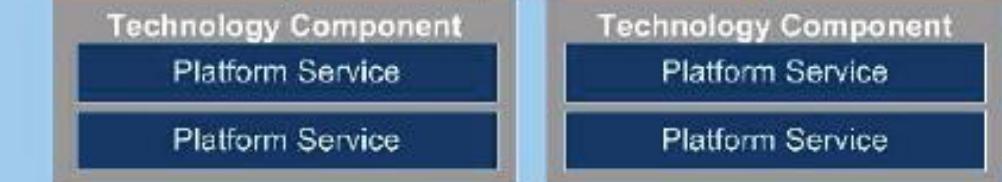
Fig.: TOGAF Architecture Development Method (ADM)



Business Architecture



Technology Architecture



Core entities and relations

- **Actor:** A person, organization, or system that is outside the consideration of the architecture model, but interacts with it.
- **Application Component:** An encapsulation of application functionality that is aligned to implementation structuring.
- **Business Service:** Supports business capabilities through an explicitly defined interface and is explicitly governed by an organization.
- **Data Entity:** An encapsulation of data that is recognized by a business domain expert as a discrete concept. Data entities can be tied to applications, repositories, and services and may be structured according to implementation considerations.

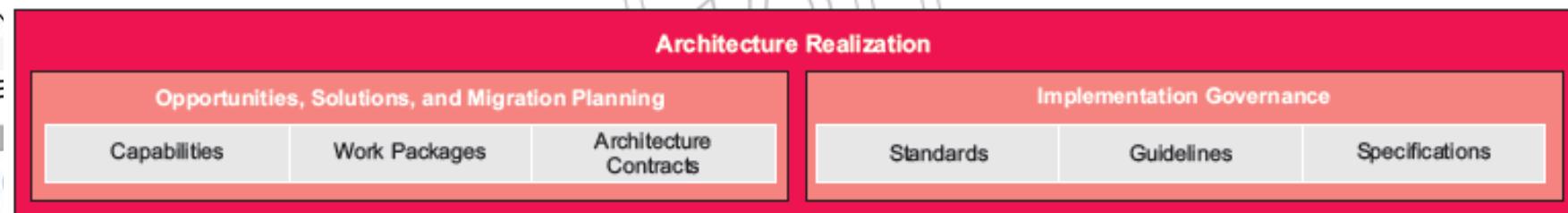
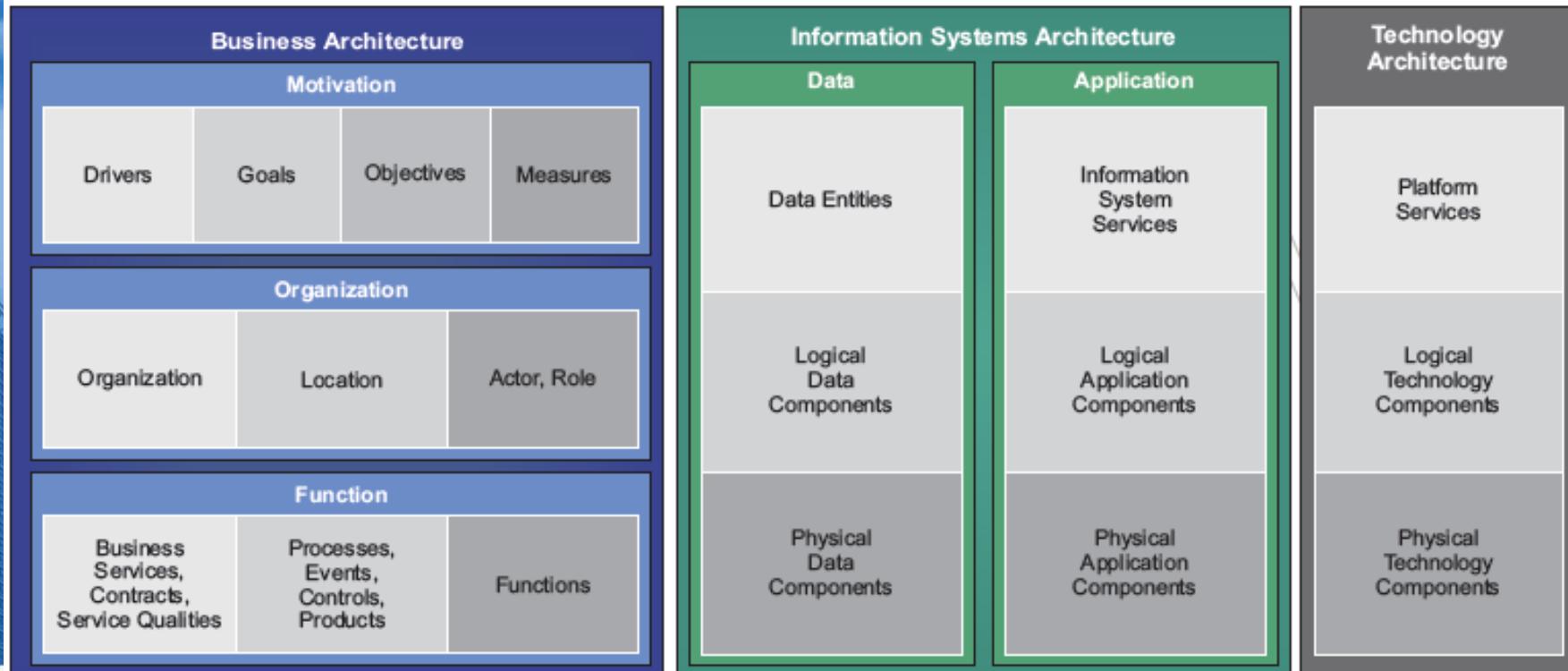
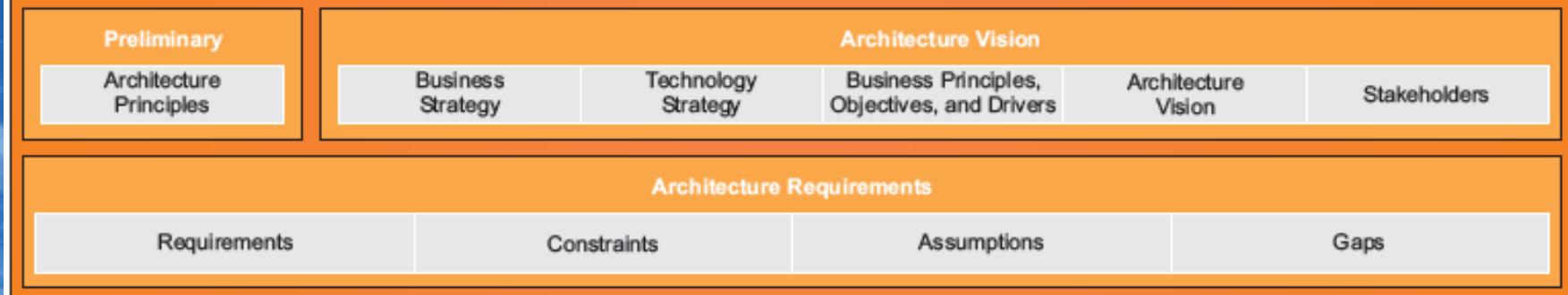


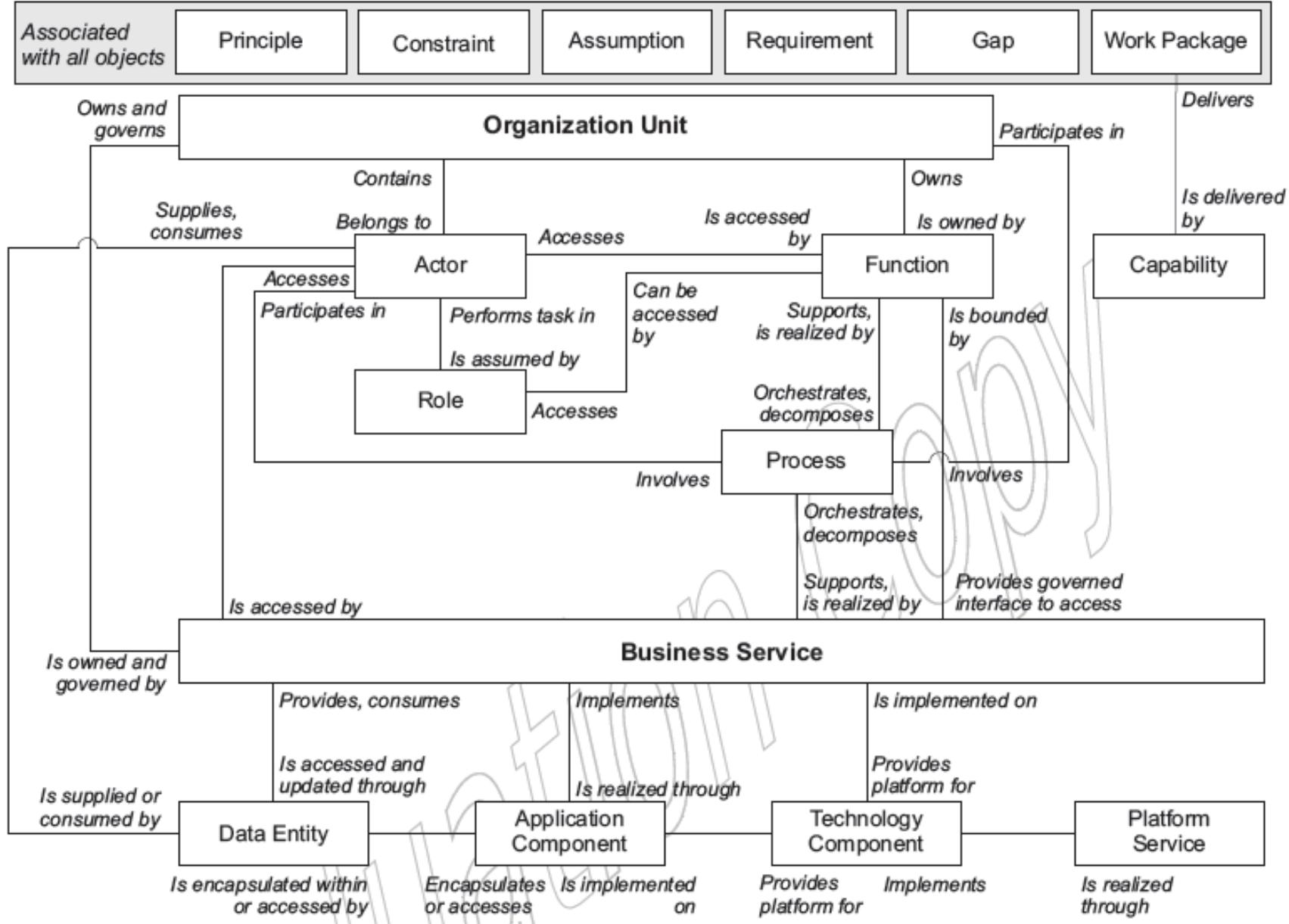
Core entities and relations II

- **Function:** Delivers business capabilities closely aligned to an organization, but not explicitly governed by the organization.
- **Organization:** A self-contained unit of resources with line management responsibility, goals, objectives, and measures. Organizations may include external parties and business partner organizations.
- **Platform Service:** A technical capability required to provide enabling infrastructure that supports the delivery of applications.
- **Role:** An actor assumes a role to perform a task.
- **Technology Component:** An encapsulation of technology infrastructure that represents a class of technology product or specific technology product.

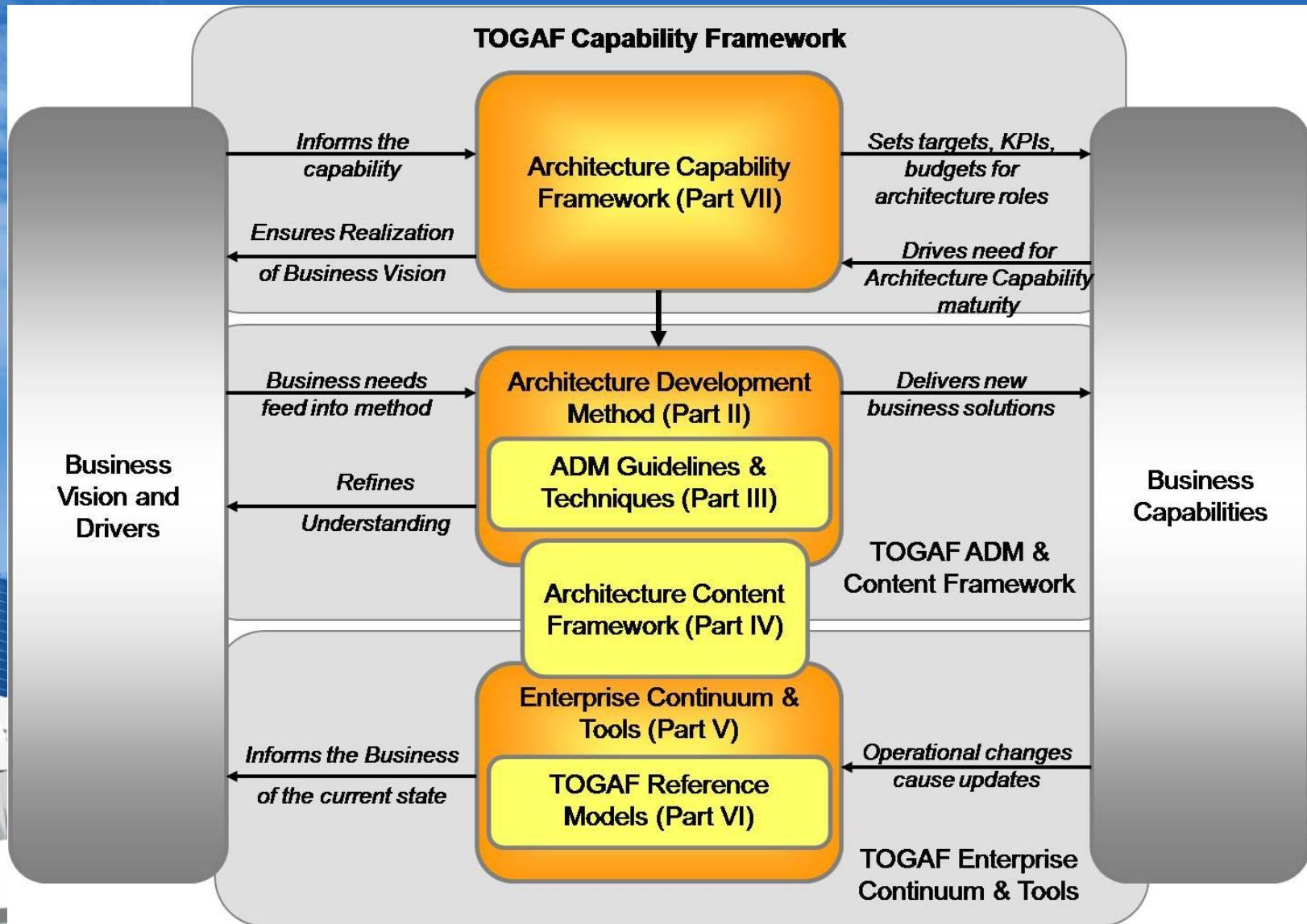


Architecture Principles, Vision, and Requirements



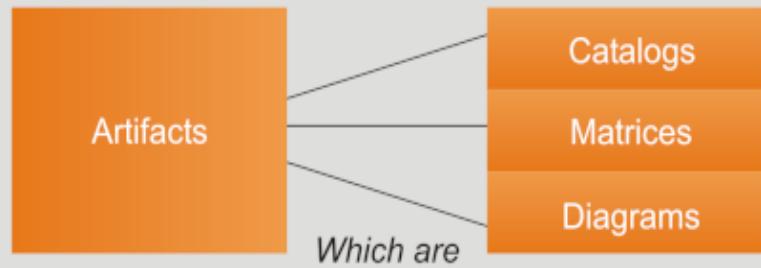


TOGAF dokument structure



Architecture Deliverables

Architecture Deliverable



Architecture Repository

Re-Usable Building Blocks

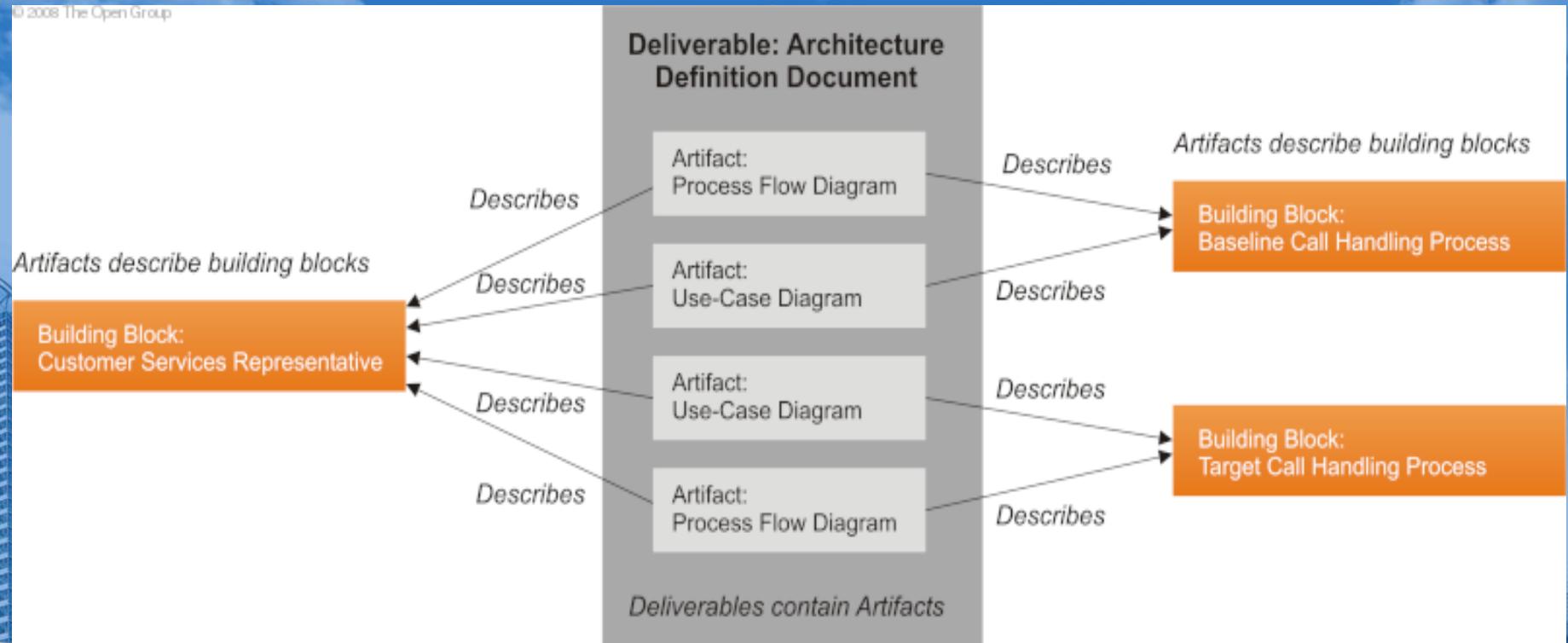
Catalogs
Matrices
Diagrams

Describing

Building Blocks

Other Deliverables

Architecture Deliverables



Gap Analysis

- Tool for validating the architecture
- The basic premise is to highlight a shortfall between the Baseline Architecture and the Target Architecture; that is, items that have been deliberately omitted, accidentally left out, or not yet defined.



Suggested steps

- Draw up a matrix with all the Architecture Building Blocks (ABBs) of the Baseline Architecture on the vertical axis, and all the ABBs of the Target Architecture on the horizontal axis.
- Add to the Baseline Architecture axis a final row labeled “New”, and to the Target Architecture axis a final column labeled “Eliminated”.
- Where an ABB is available in both the Baseline and Target Architectures, record this with “Included” at the intersecting cell.
- Where an ABB from the Baseline Architecture is missing in the Target Architecture, each must be reviewed. If it was correctly eliminated, mark it as such in the appropriate “Eliminated” cell. If it was not, an accidental omission in the Target Architecture has been uncovered that must be addressed by reinstating the ABB in the next iteration of the architecture design — mark it as such in the appropriate “Eliminated” cell.
- Where an ABB from the Target Architecture cannot be found in the Baseline Architecture, mark it at the intersection with the “New” row as a gap that needs to be filled, either by developing or procuring the building block.



Gap Analysis

Target → Architecture Baseline Architecture ↓	Video Conferencing Services	Enhanced Telephony Services	Mailing List Services	Eliminated Services ↓
Broadcast Services				Intentionally eliminated
Video Conferencing Services	Included			
Enhanced Telephony Services		Potential match		
Shared Screen Services				Unintentionally excluded - a gap in Target Architecture
New →		Gap: Enhanced services to be developed or produced	Gap: To be developed or produced	

Enterprise Continuum

- Zasazuje do kontextu jednotlivé architektonické modely. Zobrazuje stavební bloky a jejich návaznosti, omezení. Současně promítá jednotlivé komponenty do životního cyklu vývoje architektury s ohledem na určené požadavky.
- Je náhledem do Architektonické repository
- Vymezuje, jak mohou být obecná řešení využita a specializována pro zohlednění požadavků konkrétní firmy
- Poskytuje metody klasifikace architektury a řešení jak se vyvíjejí z obecných do specifických



Enterprise Repositories
(including
Requirements Repository,
Architecture Repository,
Design Stores,
and CMDB)

The Enterprise Continuum provides structure and classification for assets in Enterprise Repositories.

Enterprise Repositories provide resources to be classified within the Enterprise Continuum.

External factors provide context

Enterprise Continuum

Architecture Context and Requirements

Contextual factors shape architectures

Architecture Continuum

Generic Architectures

Generalization for future re-use

Specific Architectures

Adaptation for use

Guides and supports

Guides and supports

Guides and supports

Guides and supports

Generic Solutions

Generalization for future re-use

Specific Solutions

Solutions Continuum

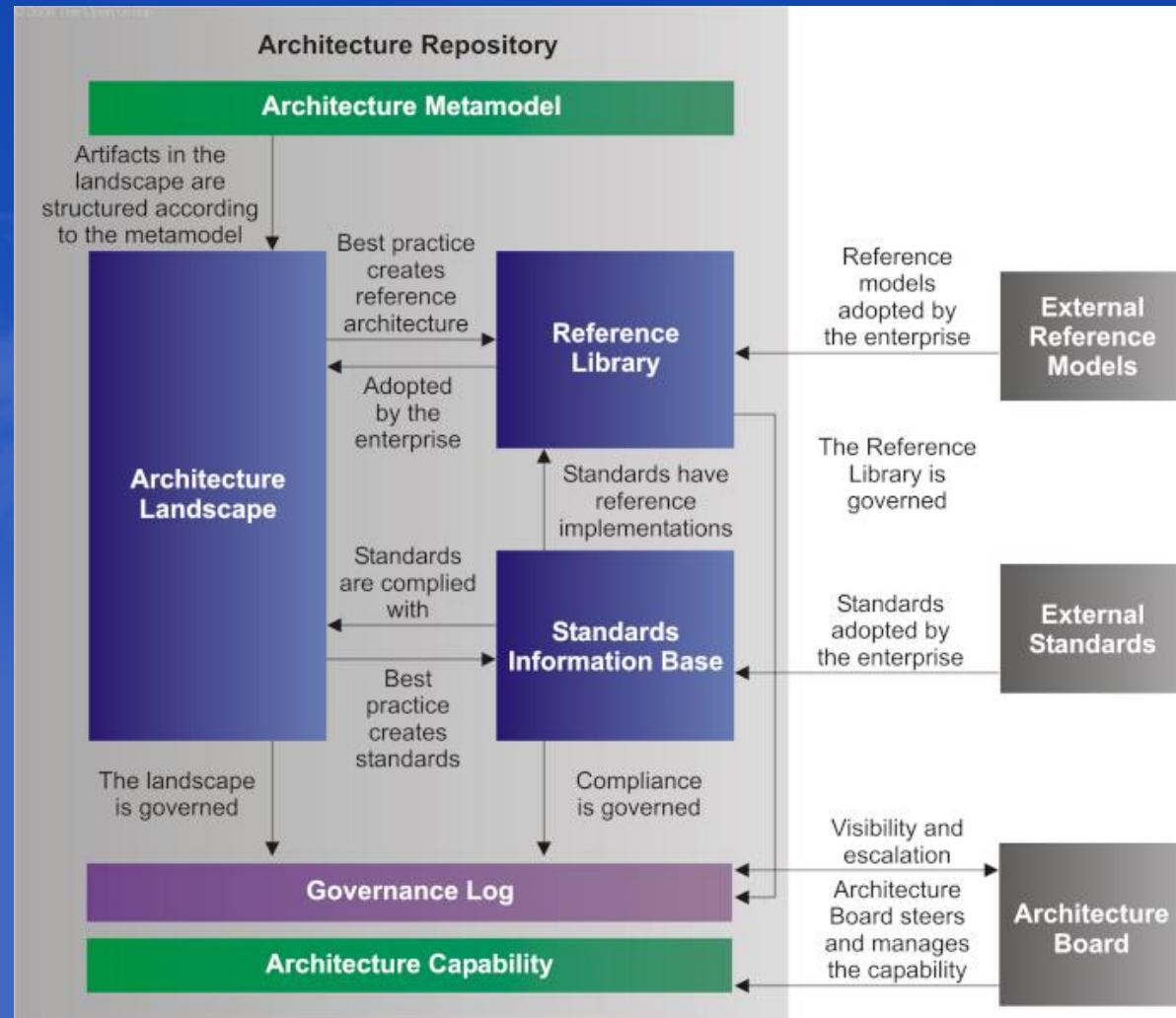
Solutions are instantiated within a deployment

Deployed solutions become Architecture Context

Deployed Solutions

Architecture Repository

- Slouží pro ukládání různých výstupů na různých úrovních abstrakce vytvořených v průběhu ADM

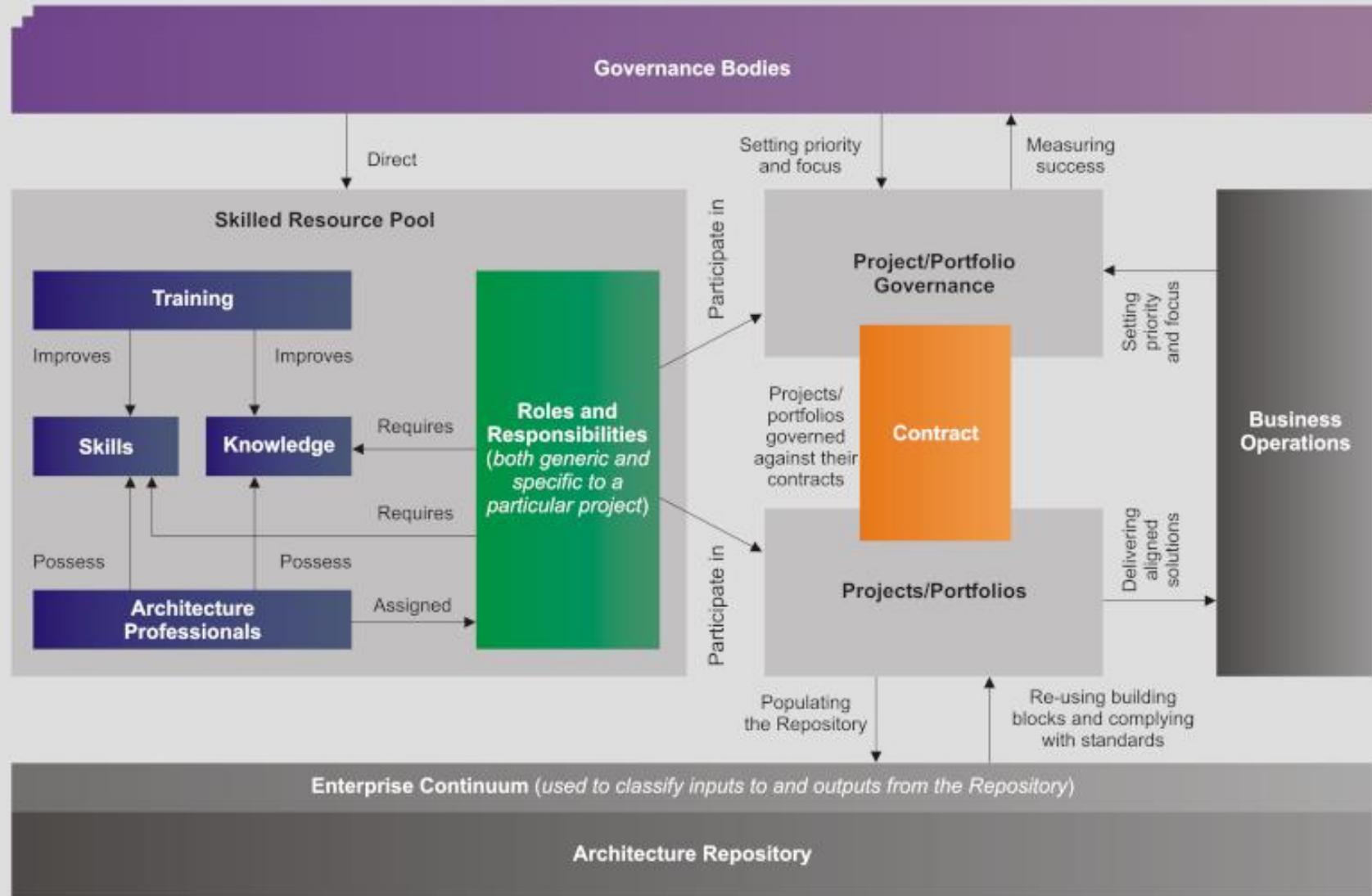


Enterprise Architecture Capability

- Způsobilost/výkonnost vyplývající z uspořádání organizační struktury, rolí a odpovědností, kvalifikací do procesů.



Business Capability for Architecture (Operating at a level of maturity)



Normy bezpečnosti

- V resources u předmětu PRI2

