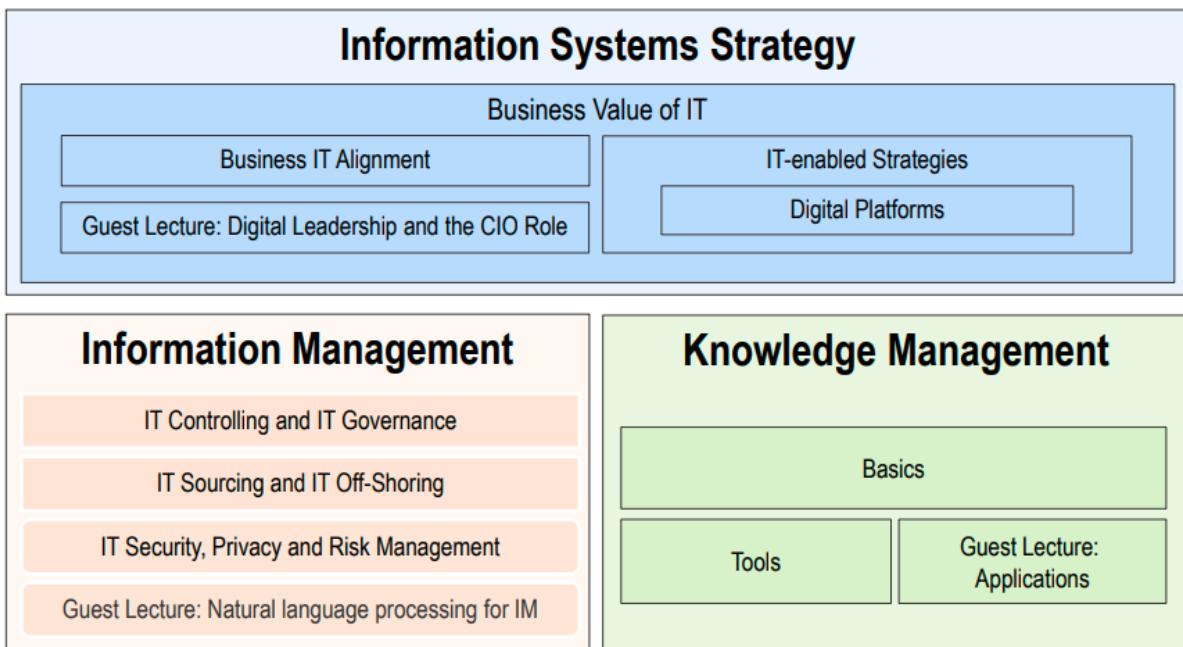


IMKM WiSe 2020



Lecture 1: Introduction

Data, Information & Knowledge - Relation

Data:

- raw facts, figures, with syntax, without meaning
- directly observable, verifiable (e.g. 10.11.20)

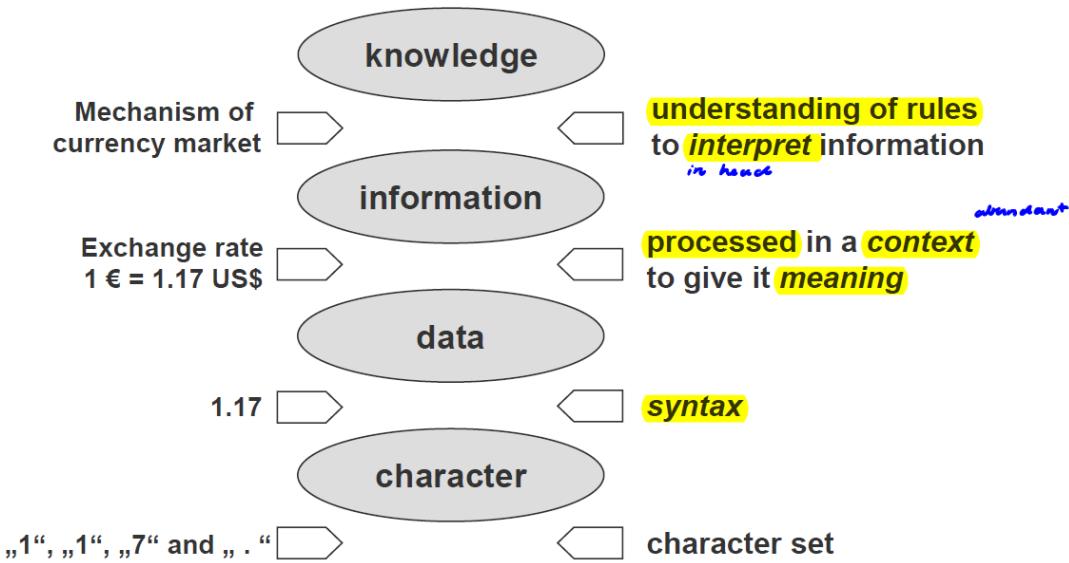
Information:

- data processed within context, to give meaning
- OR data processed into form that gives meaning (e.g. 10.11.20 date of exam)

Knowledge:

- understanding of rules needed to interpret information
- collection of information, intent to be useful
- Characteristics: use does not consume, transfer without loss, abundant, “walks out of door”

Character – Data – Information – Knowledge



Types of Knowledge

Explicit:

- objective, rational, technical
- codified (policies, reports)
- leaky

Tacit:

- subjective, cognitive, experimental learning
- personalized
- difficult to formalize
- sticky

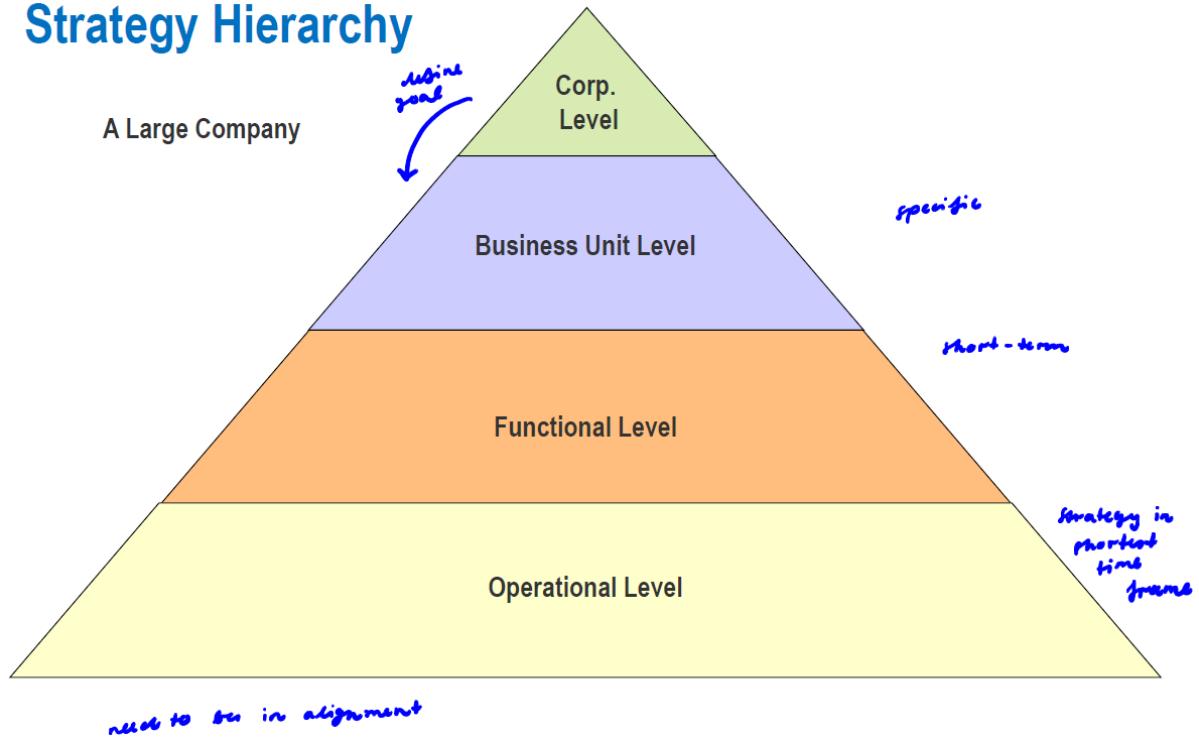
Strategy:

- **plan of action** for goal (long & short- term)

Strategic Management:

- examining (present/future environments)
- formulating objectives
- making, implementing and controlling decisions (on achieving objectives)

Strategy Hierarchy



Corporate Strategy

- determine type of business
- form & management of **overall activities**
- Choose: Growth/stability/retrenchment(reduce cost) strategy

Generic or business unit strategy

- actions crafted by mgmt for successful performance in **one particular line of business**
- Choose: Cost leadership/ differentiation/ focus / mixed

Functional strategy

- game plan for running **major functional activity** or process (e.g. research unit)

IT strategy, information management and knowledge management -

Relation

Information Systems (IS) Strategy - What?

- sociotechnical system (task, people, structure, technology)
- focus on system or business applications of IT
- Business-IT-Alignment for strategic benefits

Information Technology (IT) Strategy - How?

- aspects of technology

→ architecture, technical standards, security levels, ...

Information Management (IM) Strategy - Which way? Who does it? Where located?

- structures & roles for management of IS and IT (e.g. relationship btw specialists and users, performance measurement, responsibilities)

Earl (1989)

Information as Production Factor

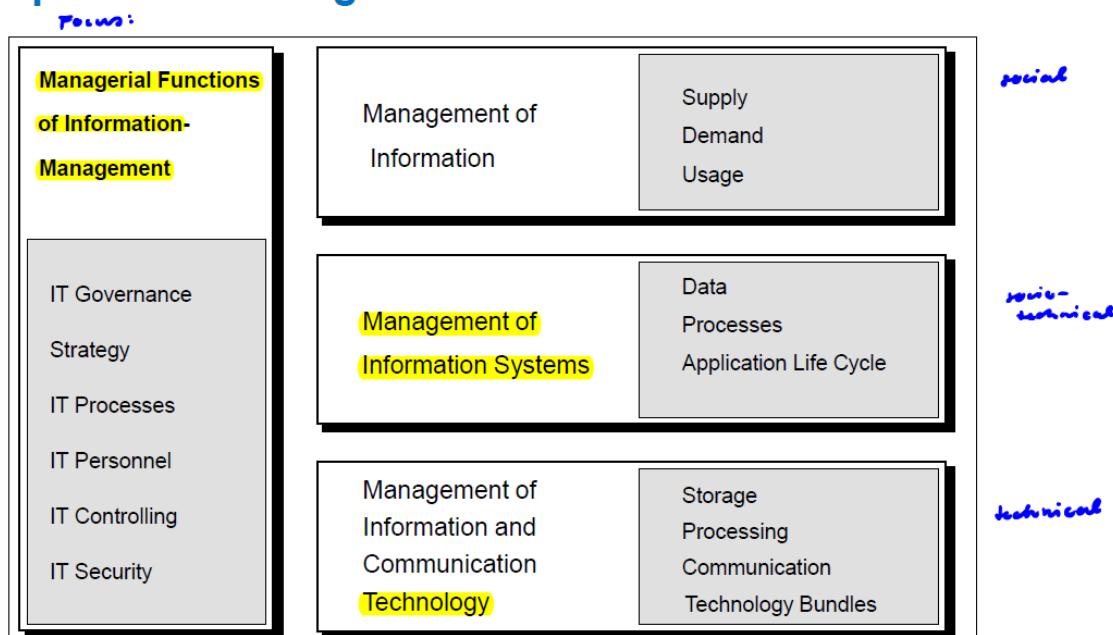
- result through combination of resources
- information as **differentiating** resource (e.g. sensors)
- competition as discovery process for new information/ adaptive learning
- business ideas from linking information
- Classic factors:
 - Land or natural resource (water, air, oil, ...) → **natural occurring**
 - Labor → **human-effort** used in production
 - Capital Stock (machinery, buildings, ...) → **human-made** goods used for production

Information and knowledge management - classification and differentiation

Information Management

- IM is part of business management (krcmar)
- ensure **optimal use of the resource information** with regard to business objectives (Krcmar)
- IS & IT as tools for managing resource information
- helps managers **assess and exploit their information assets for business development**

Recap: IM – An Integrated Framework



→ IM is an important **foundation for knowledge management** and deals systematically with **explicit knowledge**

- understanding Knowledge Management requires understanding knowledge, knowledge process and differentiation from Information & IM

Knowledge Management

- understanding information flow, implementing learning practices to **make explicit**
- approach to use enterprises intellectual assets
- create/enhance/share intellectual capital
- knowledge as resource

→ Knowledge Management deals with **all kinds of knowledge**, information management with some forms of explicit knowledge

Amazon AWS

- example fit of topics
- need: faster technology deployment → **alignment IT-Systems** to needs, **IT-enabled new strategies** based on **digital platform**
- emerged for asking employees where (not) doing well? (**digital leadership**)
- inaccurate forecasting of project time, decoupled parts need to be governed (**IT-Controlling & Governance**)
- Customers source parts of IT from AWS (**IT Sourcing**)
- **Knowledge Management** (finding right people)

Challenges information and knowledge management from strategy perspective

- Big picture
- New trends & challenges from different stakeholders: Business, Organization, Technology & People

Business trends:

- digital platforms & ecosystems (value co-creation, monopolies, dependencies, changing inter-firm relations)
- sustainability & social responsibility
- ubiquity / democratization of digital technology
- data-driven decision making

→ Uber, facebook, ... (more complex business models centered around consumer)

Organization trends:

- distributed work & information systems (cloud, APIs, ...)
- digital maturity of organizations & people → besser auskennen, erfahrungen
- thriving in digital complexity (innovation, strategic agility to respond to unpredictable opportunities and threats, resilience in uncertain environments)
- from functional view to scaling agile (see, understand, live → cross-functional, cross-process)

People trends:

- distributed workspaces (team work, culture)
- information & work overload
- AI replacing human tasks
- data privacy
- Employee turnover

Technology trends:

- Gartner's Hype Cycle: ML, AI, composable enterprise, own identity

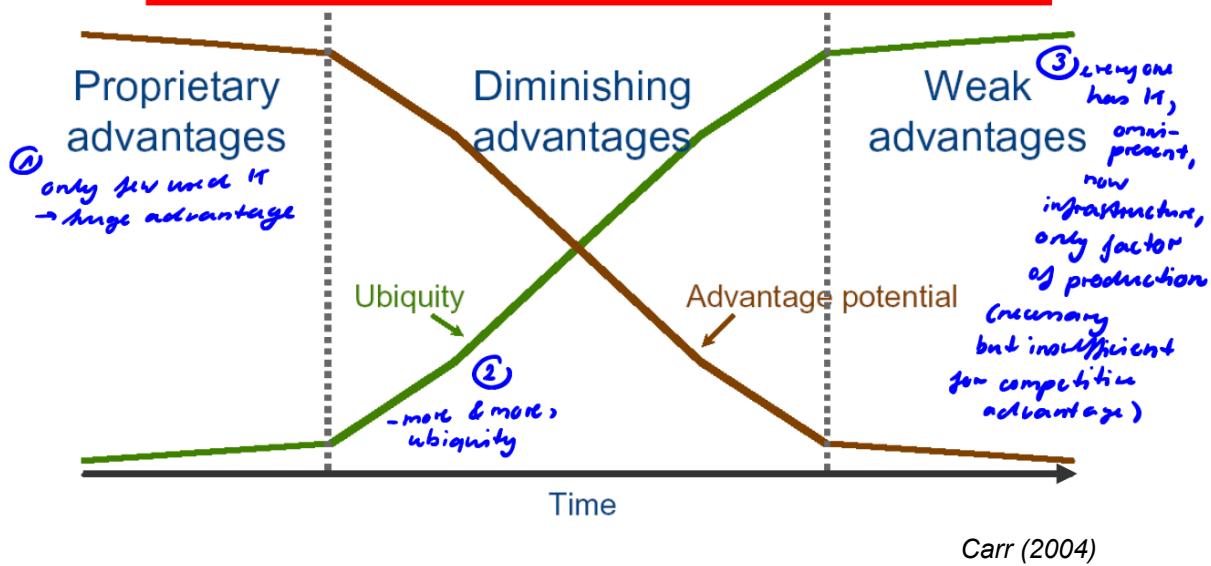
Lecture 2: Business Value of IT

Understand role of IT and IS for firms

Evolution of Technology

- It as commodity → no advantage, follow not lead, focus on vulnerabilities (Carr)
- create competitive advantage with IT through efficient use (Carr)

IT becomes a simple factor of production!



→ Now: less advantage when more use IT, Proprietary → infrastructural

- software stack continues to be commoditized, yet specialized software remains strategic
 - best business software is invisible → still needs to be managed
- infrastructural part of IT is expanding!, Strategic part/competitive advantage of IT shrinking (?) (Carr)
- Overall: Role of IT-leaders declining (2007), cost is not value & hard to quantify (2011), argument & communicate value of IT (2017), Digital Transformation & huge change (nowadays)

Discuss approaches to identify & evaluate value of IT/IS and IT/IS investments

Challenges of evaluating IT value

- IT/IS creates value: **different types** (financial: ROI, intermediate: process-related, affective: perception-related)
- IT/IS creates value under **certain conditions** (need to fit in strategy, clear alignment): part of business value creation process with other organizational factors (**synergistic** = mitwirkend)
- IT/IS value **manifests in many ways** : different ways (productivity, profitability), different levels e.g individual (satisfaction), firm, industry
- IT/IS based value != **IS based competitive advantage**: differential value (SIS) → advantage
- IT/IS based value could be latent (**time lag**)
- **Numerous factors mediate** IT/IS & value
 - IT resources → Mediating factors: IT and Organizational Complementary Resources, Organizational Capabilities, IT-Strategy Alignment → IT Intermediate value -> Output value (perceived by customers) / Financial value

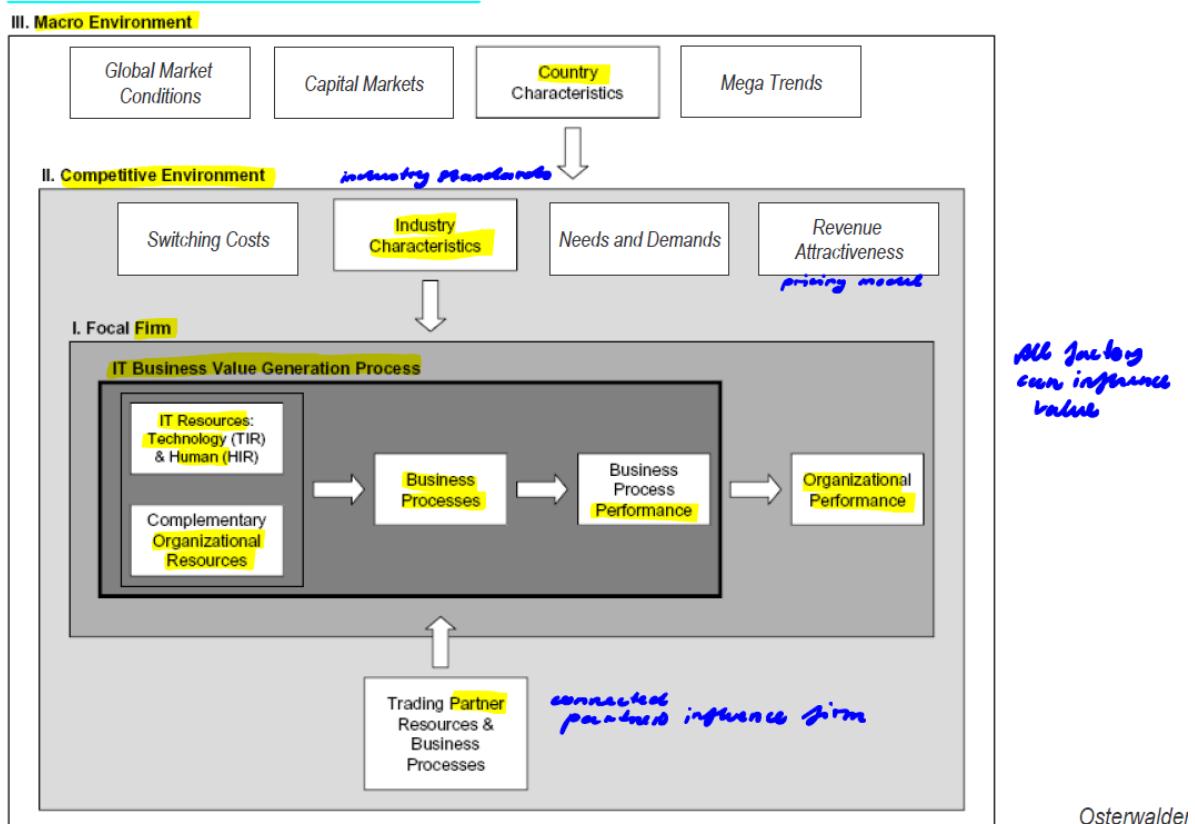
→ IT/IS value Causality is elusive: **difficult to fully capture** and attribute value generated by IT/IS investments

IT/IS Potentials

IT-Potential	Organizational Influence/Benefit
Automate	Reduction of Manual Actions
Informate-up	Providing information to top management.
Informate-down	Providing information to employees across the firm.
Sequential	Natural Order of Activities or Even Parallelizing Processes
Precise/targeted	Continuous Process Monitoring
Analytical	Complex Analysis of Existing Information
Integrative	Pooling of Heterogeneous Activities
Knowledge creating	Creation of Knowledge and Expertise
Simplifying	Removing of Intermediaries and Business Process Redesign
Geographical	Overcoming Space
Transform	Redefining the business model, business processes and relationships of the firm

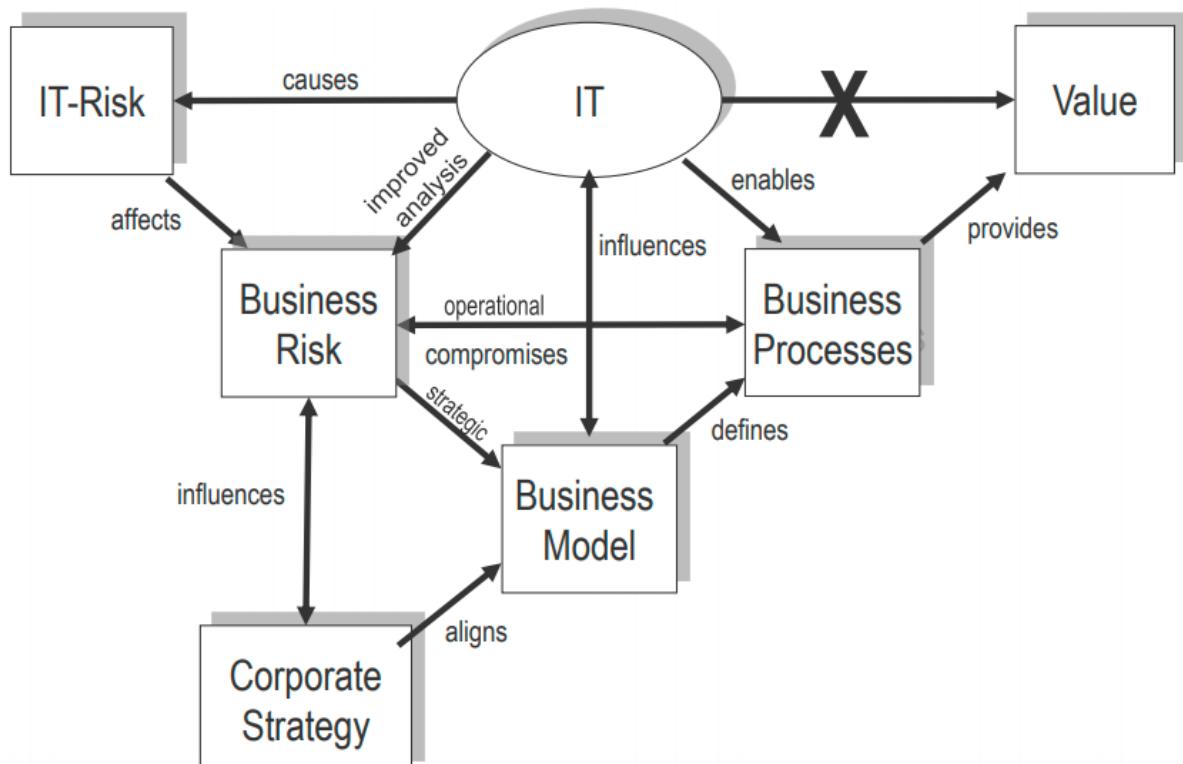
Davenport (1993) & Vial (2019)

Contextual Factors influencing Business Value of IT



Melville (2004) & Osterwalder, Pigneur (2010)

IT-benefit mechanics



Consequences of IT/IS Value Ambiguity

- cannot articulate value → tend to focus on cost
 - cost of IT appears: substantial, never-ending, not well managed
 - Creates IT direction toward: under-investment, down-sizing, outsourcing
- problem: cut of IT

Path of communicating IT/IS value (CIO)

1. change thinking; avoid value traps
 2. show that IT/IS provides value for money
 3. show how IT/IS improves business performance
 4. show how value is created beyond and behind IT/IS
- changing mindset to long-term picture for success

Digital Business Strategy

- **IT Strategy and Business Strategy not divided anymore**
- adapt business infrastructure to digital value

Key External Digital Trends

- Pervasive Connectivity
- Information Abundance
- Global Supply Chains
- Improved Price/Performance of IT
- Growth of Cloud Computing
- Emergence of Big Data

- Scope of Digital Business Strategy
- Scale of Digital Business Strategy
- Speed of Decision Making
- Sources of Value Creation and Capture

Performance

Key Organizational Shifts

- Limitations of Traditional Business Models
- Trans-functional Role for IT
- New Mandate for IT and the CIO
- Increased Familiarity with IT

- organizational strategy formulated and executed by leveraging digital resources to create **differential value**
- Going beyond the traditional view/ beyond systems and technologies,
- elevating the **performance implications of IT strategy** beyond efficiency and productivity metrics to those that drive competitive advantage and strategic differentiation

Bharadwaj (2013)

Apply & discuss measurement methods of Business Value of IT: Frameworks

"When you cannot measure, your knowledge is of a meager and unsatisfactory kind"
(William Thomson)

Classic Measures:

- earnings growth
- market share
- customer awareness and satisfaction

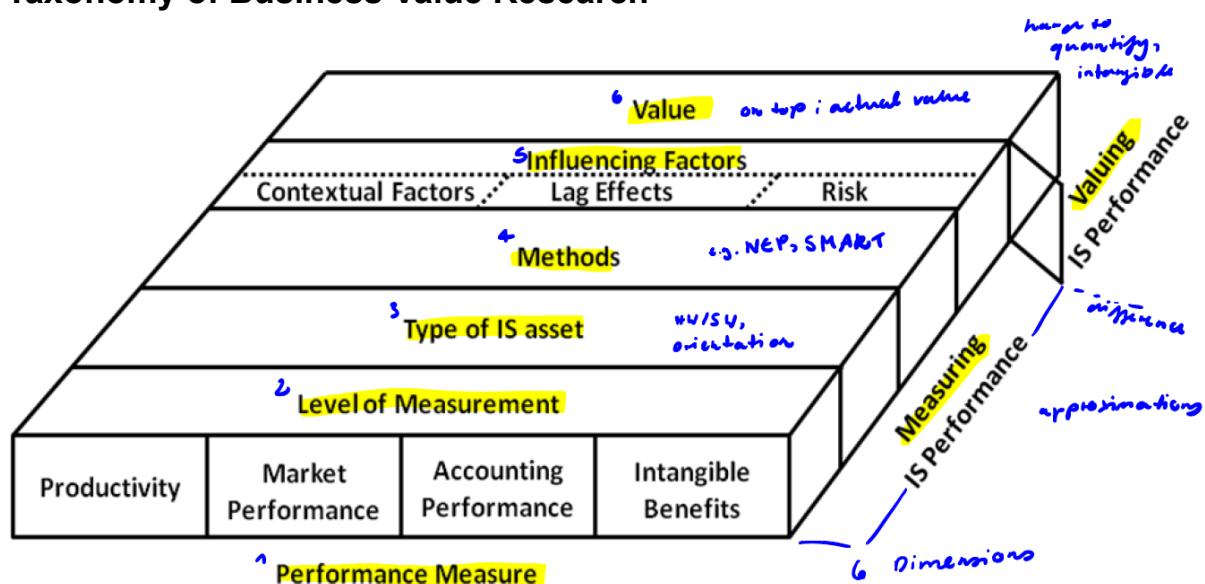
Performance Measures of IT/IS Business Value

- **Productivity**: Production efficiency, Economic Growth
- **Market performance**: total shareholder return, stock market reaction
- **Accounting Performance**: Cost ratios, turnover ratios, profit ratios
- **Intangible Benefits**: Increased capabilities, knowledge, better decision making, competitive advantage

Level of Measurement of IT/IS Business Value

- measure effects of IT investments on different levels but other factors might change
- Process Level: Efficiency
- Firm level: Stock
- Micro/Project level
- Industry/competitive level: compare
- Macro-economic/country level
- customer surplus

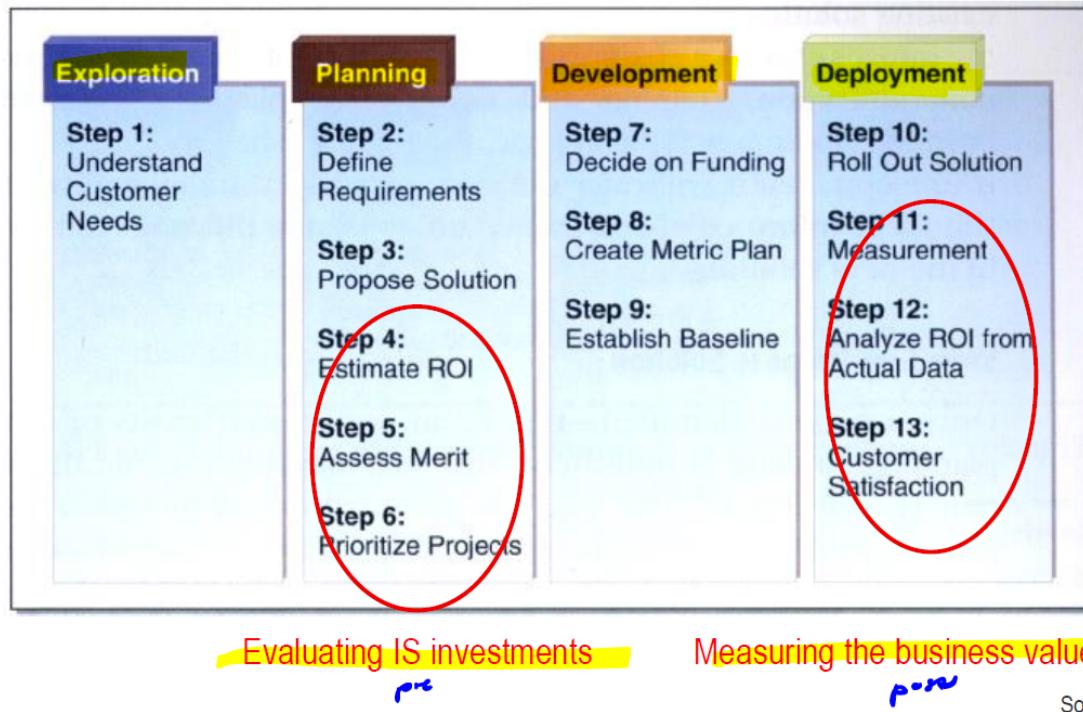
Taxonomy of Business Value Research



Schryen (2010)

IT/IS Business Value- Distinction

- Measuring business value of IS: assessing business value post-investment: Is system resulting in performance gain? Can gain be measured? How?
- Evaluating IS investments: assessing feasibility of new investments pre-investment: Should invest in new system/IT? Cost? Expected gain?
- Business Value Process



Source: Sward

Sward (2006)

Apply & discuss measurement methods

Methods

- Analytic/Integrated/Economic Discounting (e.g. NPV) Appraisal

Simple Multi Attribute Rating Technique (SMART)

- systematic process for decision making
- 8 Steps:
 1. Identification of decision maker
 2. Identification of **alternatives**
 3. relevant **attributes** (cost, time, quality, flexibility)
 4. Measure value of benefit for (alternative, criteria)
 5. Assignments of weights for criteria
 6. Calculation of **weighted arithmetic mean**
 7. Provisional decision
 8. **Sensitivity analysis**

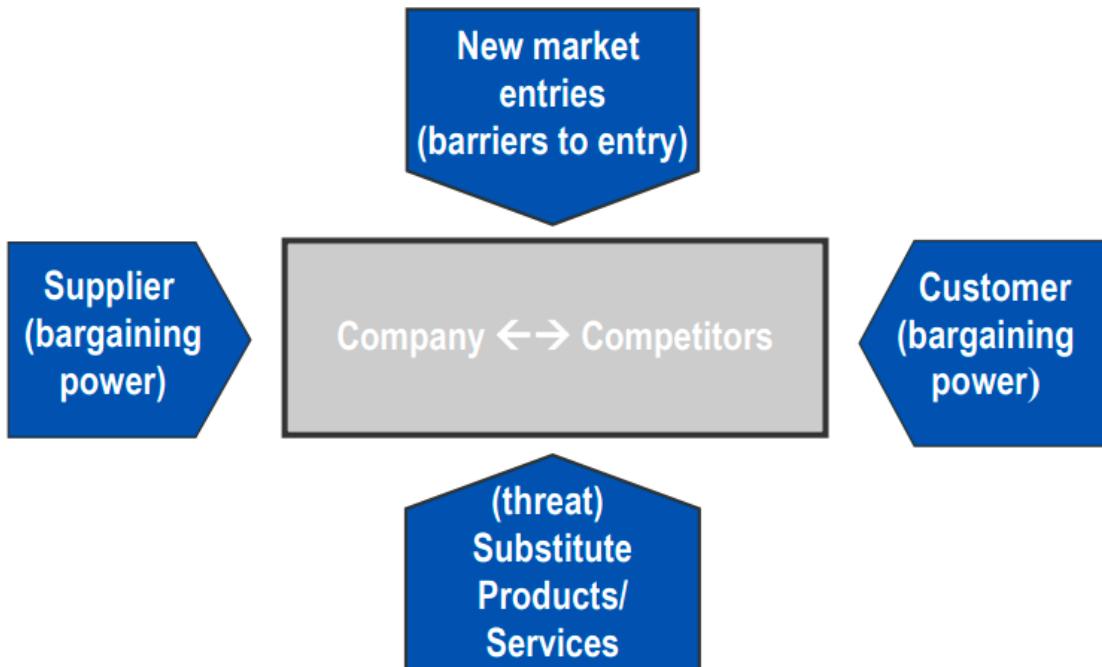
Lecture 3: Strategy and Business Alignment

Differentiate different terms related to strategy

→ siehe lecture 1 (IM, IS, IT)

Understand and apply the market-based and resource-based view

Market-Based View (MBV) - Porter's Five Forces



- companies search for attractive markets and position yourself within competition: choose generic strategy, influence direct market surroundings
- Starting point: **objectives** that should be reached
- "**Structure follows strategy**": companies' organizational structure should follow the targets
- emphasize the role of **external factors** (attractiveness of industry, competitive forces) for business success



→ Decide for one Strategy, don't get stuck in the middle!

Cost Leadership: striving to be the low-cost producer in an industry

- effective if ...
 - ... market is composed of many **price-sensitive** buyers
 - ... there are few ways to achieve product **differentiation**
 - ... buyers do **not care** much about **differences** (brands)
 - ... there is a large number of buyers with **high bargaining power** (verhandlungsmacht)
- idea: drive competitors out of the market
 - gain market share and sales
 - **underprice** competitors
 - offer better **cost-value** ratio (similar price, but better value)

Differentiation: produce products that are considered unique

- allows a firm to ...
 - ... charge **higher prices** for its products
 - ... gain **customer loyalty**
- risk: unique product **may not be valued highly enough** by customers to justify the higher price

Focus on Niche: producing products and services that fulfill the needs of small groups of customers

- effective if ...
 - ... the niche is **profitable and growing**
 - ... industry leaders are **uninterested** in niche
 - ... industry offers **several niches**
 - ... there is little competition in the niche segment
- **low-cost** focus strategy
 - offers products/services a small range (niche) of customers at the lowest price available
- **best-value** focus strategy
 - “-” at the best price-value available
 - called “focused differentiation”

Resource-Based View (RBV)

- 2nd alternative theory for competitive advantage
- Success & failure depends on companies' internal capabilities
- core competencies & resources responsible for success/competition (starting point for strategy development)
- recommendations for core competency management
 - determine existence of core competencies and analyze their potential
 - keep tangible resources up to date
 - develop intangible resources/capabilities
- **VRIN**
 - V = Valuable: enable firm to implement strategies (increase efficiency and effectiveness)
 - R = Rare: not available to other competitors
 - I = Imperfectly imitable: hard to implement by others
 - N = Non-substitutable: can not be replaced by some other non-rare resource
- Relationship of components: Resources → **Competencies** → Product
- **Dynamic Capabilities:** relate to **change** in organization, 3 primary clusters of competencies
 - Sensing: Identification/Assessment of opportunity
 - Seizing: Mobilization of resources
 - Transforming: Continued renewal
 - source for long term competitive advantage (renewal of components following vision)
- **Components of RBV:**
 - **Vision**
 - **Dynamic Capabilities:** Sense innovation, Adapt resources & competencies in changing environment → *Knowledge (how transform e.g. electric)*
 - **Competencies:** use resources efficiently → *Knowledge (e.g. how use IT)*
 - **Resources:** VRIN (e.g. assets, capital, structure) → *Knowledge, Information (asset) (e.g. customer data & manager process knowledge)*

What are strengths and weaknesses of the two views?

- difficult to measure innovation on market → disruptive innovation hard to foresee
- very large players: cannot apply theories
 - more supply side, contribution on customer side possible
- Mostly valid for dynamic firms

Understand, differentiate and discuss two strategic alignment models

Strategic fit (among many **activities**) → *Porter (1996)*

- fundamental to competitive advantage and to its sustainability
- hard for rival to match array of interlocked activities; (it's easier to imitate particular sales-force approach, match process technology, or replicate product features)

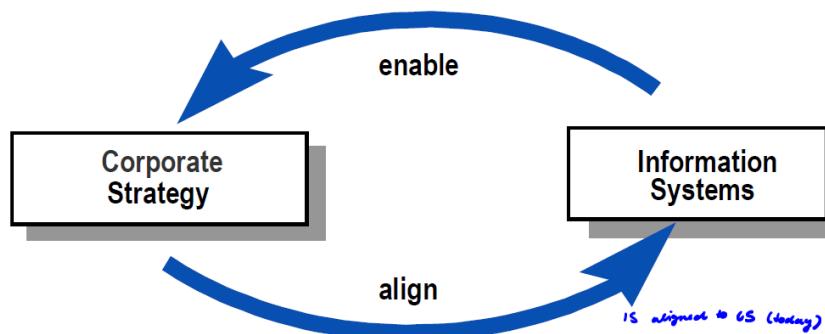
Strategic Alignment → *Reich & Benbasat (2000)*

- extent to which business mission supported by **IS mission** (strategic level)

Alignment → *Henderson & Venkatram (1993)*

- Degree of fit & integration among Business/ IT strategy and Business/ IT infrastructure

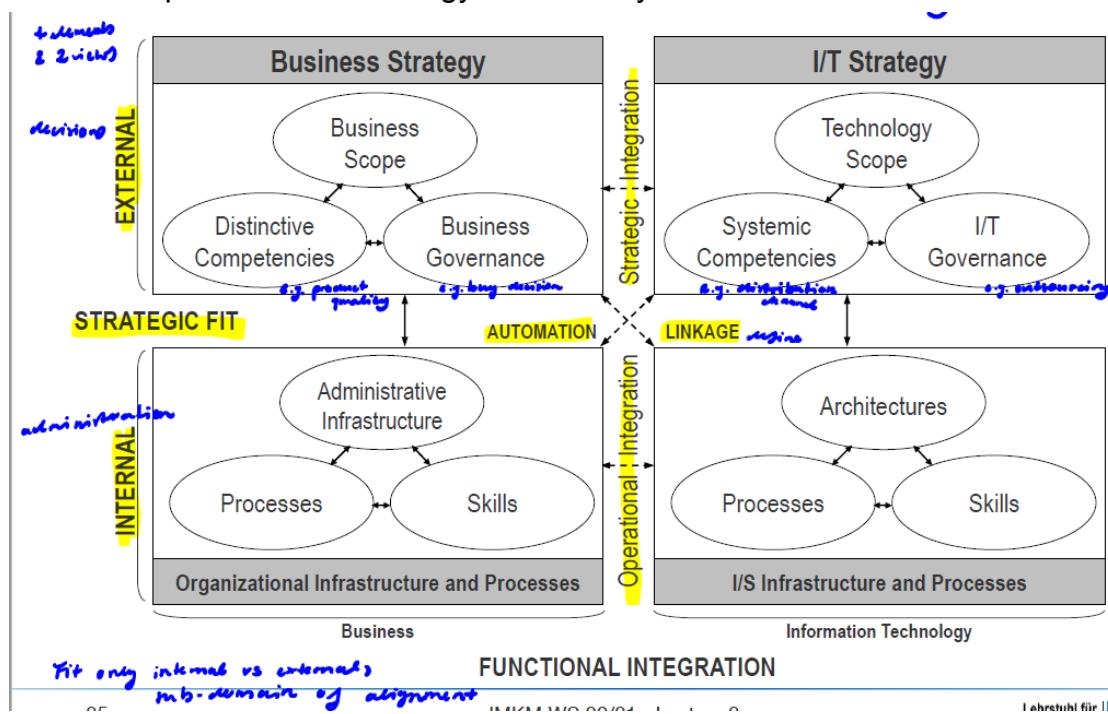
Relationship Corporate Strategy & IS



Krcmar (2015)

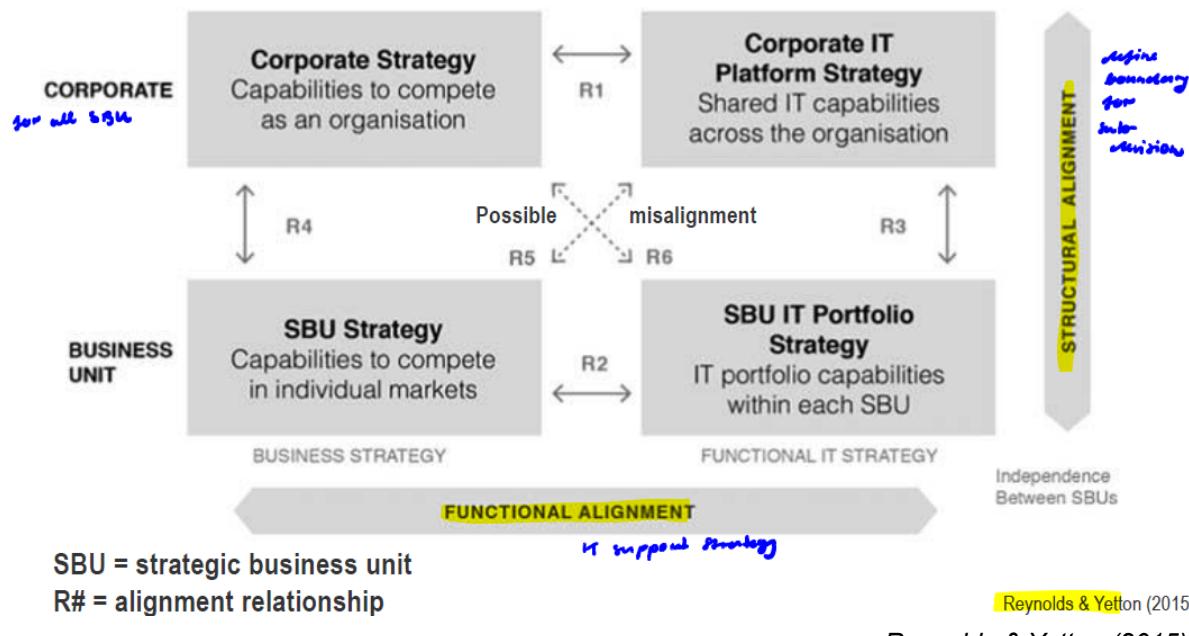
Strategic Alignment Model

- for companies with 1 strategy & 1 industry



Henderson & Venkatram (1993)

IT alignment Multi-Business Organizations



- **Functional Alignment (R1):**
 - Corporate strategy provides boundaries for IT platform strategy
 - Corporate IT Platform needs to align with strategy
- **Functional Alignment (R2):**
 - SBU IT portfolio needs to support business strategy
 - SBU strategy provides requirements for SBU IT portfolio
- **Structural Alignment (R3):**
 - Corporate IT Platform leverages synergies shared across IT services
 - Independence btw SBU IT Portfolios (if relevant for more than one SBU move to IT Strategy)
- **Structural Alignments (R4):**
 - Corporate strategy provides boundaries for strategies of SBU
 - SBU strategy has high degrees of freedom within corporate strategy boundaries
- **R5:**
 - SBU strategies do not define corporate platform strategy
 - IT capabilities should not meet individual SBU strategy requirement → Possible **Misalignment**
- **R6:**
 - Corporate strategy does not specify IT capabilities for SBU IT portfolios
 - SBU IT portfolios should NOT include IT capabilities to be shared across SBUs → Possible **Misalignment**
- Paths temporal Alignment in Multi-Business Organizations
 - **P1:** Corp Strategy → Corp IT P. Strategy: Sequence of strategic choices to develop shared IT platform capabilities
 - **P2:** Corp Strategy → SBU Strategy → SBU IT P. Strategy: To develop IT application capabilities (top-down, business-led)

Implication Business Strategy Alignment:

- Alignment of Business Strategy & IS Strategy leads to Business Performance

Lecture 4: IT-enabled Strategies

Understand & Identify strategic Information systems

Strategic Information Systems (SIS):

- assure competitive advantage for company (avoid drop)
- e.g. Netflix, Uber, airbnb
- System Categories
 1. Inter-Organizational Systems
 - connect two partners in value chain (e.g. flixbus)
 - differentiate by system developer & operator
 2. Value-Added Services
 - support offering state (order initiation/ processing) & improve customer service/relation (after-sale, additional services to product)
 3. IT for new products and services
 - develop new products & business areas (e.g. iPhone)
 - evolutionary (instead of revolutionary)
 4. Electronic markets
 - enable and merge transactions via digital platforms
 - revolutionary (e.g. amazon, netflix)

McFarlan's Strategic Grid

- determining impact of information systems on strategy
- Porters Competitive Forces help with decision making

High IT impact on core operations	Factory	Weapons <i>strategic</i>
Goal: Improve performance of core processes <i>ERP</i>	Goal: Transform Organization or Industry <i>also disruptive: uber, netflix...</i>	
Low IT impact on core operations	Support	Breakthrough <i>strategic in future</i>
Goal: Improve local performance <i>more room for error</i>	Goal: Identify and launch new ventures <i>testing new business models : DriveNow by BMW</i>	

IT impact on **core strategy**

Applegate (2004)

Adaptability Gap in Digital Business

	Traditional Business	Digital Business
environment	stable	dynamic
level of competition	low	high
certainty	certain	uncertain
Knowledge	utilization	creation & innovation
Business processes	simple & static	dynamic & IT-based
Ways of doing business	limited	multiple
stakeholders pressure	moderate	severe
Adaptability Gap between Business Strategy & Business Processes	no	yes

Understand & Identify business model construct, differentiate its elements in practice

Business Model:

- fill gap between Business strategy (highly aggregated) and Business process model (operational, detailed) with a business model (= conceptual tool of alignment, tactical)
- **Druckers Question:** Who is customer, what does he value, and how does an organization intend to earn money?
- Example representation: **Business Model Canvas** (Key Partners, Key activities, Key Resources, Value Proposition, Customer Relationship, Channels, Customer Segments, Cost Structure, Revenue Streams)

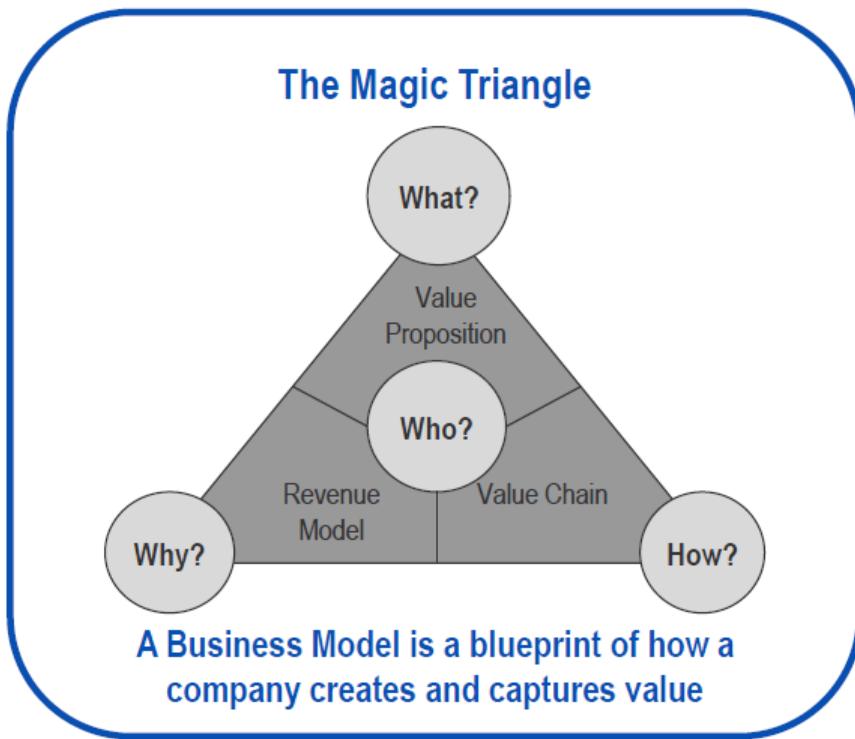
Key Partners	Key Activities	Value Proposition	Customer Relationships	Customer Segments
Who are our Key Partners? Who are our key suppliers? Which Key Resources are we acquiring from partners? Which Key Activities do partners perform?	What Key Activities do our Value Propositions require? Our Distribution Channels? Customer Relationships? Revenue streams?	What value do we deliver to the customer? Which one of our customer's problems are we helping to solve? What bundles of products and services are we offering to each Customer Segment? Which customer needs are we satisfying?	What type of relationship does each of our Customer Segments expect us to establish and maintain with them? Which ones have we established? How are they integrated with the rest of our business model? How costly are they?	For whom are we creating value? Who are our most important customers?
Key Resources			Channels	
What Key Resources do our Value Propositions require? Our Distribution Channels? Customer Relationships? Revenue Streams?			Through which Channels do our Customer Segments want to be reached? How are we reaching them now? How are our Channels integrated? Which ones work best? Which ones are most cost-efficient? How are we integrating them with customer routines?	
Cost Structure		Revenue Streams		
What are the most important costs inherent in our business model? Which Key Resources are most expensive? Which Key Activities are most expensive?		For what value are our customers really willing to pay? For what do they currently pay? How are they currently paying? How would they prefer to pay? How much does each Revenue Stream contribute to overall revenues?		

Osterwalder & Pigneur (2010)

- Value Proposition Canvas (for specific customer group, pain & gains)

Magic Triangle

- 4 elements of business model (~ Drucker)



Gassmann (2014)

WHO are our target customers? → customer

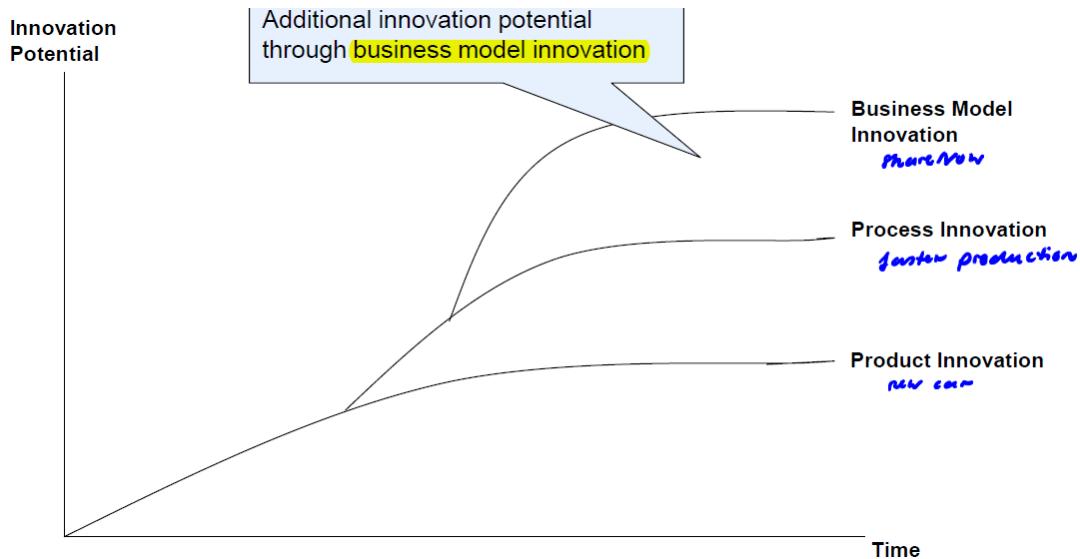
WHAT do we offer to customers? → value proposition

HOW is the value proposition created? → value chain

WHY does it generate profit? → profit mechanism

Understand Business model innovation & identify in practice

Innovation Potential of Business Model Innovations (Gassmann 2014)



A **business model innovation** ...

- ... creates new logic regarding how a company creates/captures value
- ... makes **changes in >= 2** of the WHAT, WHO, HOW, and WHY

Differentiate types of IT-enabled business models

Types of IT-Associated Business Models (Steininger 2019)

Dimension Type	Facilitator	Mediator	Outcome	Ubiquity
Value created through	Sale of traditional goods or services	Mediation and physical delivery, sale of traditional goods or services	Sale of hardware or software	Completely digitized product or service, digitally sold and delivered
Diffusion of IT in the business model of sample ventures	In the infrastructure management pillar of the business model	In the infrastructure management and the customer interface pillars <i>IT-mediated shipping & payment</i>	In the infrastructure management and the value proposition/ product pillars ;	In the infrastructure management, the customer interface, and the value proposition/ product pillars
Proposed definitions	IT-facilitated business models	IT-mediated business models	IT-bearing business models	Digital business models

Product Value/Creation	low	low	high	high
Infrastructure Management	Use of IT	Use of iT	Use of IT	Use of IT
Customer Interface	No IT	IT	No IT	IT

- %start-ups: 1990: Facilitator or Outcome, Now: also IT as Mediator & Ubiquity
- Product value: Value proposition (what), infrastructure: Key resources (how), customer interface: Revenue streams (why)

IT as Mediator: Hummel

- fashion brand
- Challenge: revenues from B2B sales, online presence through websites of partners, different brand experience for customers in each channel
- Approach: **Omnichannel strategy**, aligning online branding, e-commerce support for B2B partners, complementing physical store experience

IT as Outcome: Press Shop

- Challenge: output quality varies depending on quality of steel coil (Stahlspule), sufficient surface oil, pressure, ...
- Approach: *steel producer delivers steel coil & production data per meter of steel* (production conditions, raw material quality)
→ Press can continuously adjust parameters according to data

IT as Ubiquity: eBooks

- postal digital mailbox, business-to-consumer communications, digital communication replaced traditional Postal communication services

Differentiate types of innovation

Innovation:

- new goods/methods/markets/sources of supply/organization of industry
- idea perceived as new
- transforms materials into products or services of greater value

Types of Innovation

		Core Concepts	
		Reinforced	Overturned
Linkage between Core Concepts and Components	Unchanged	Incremental innovation	Modular Innovation
		<ul style="list-style-type: none"> refines and extends an established design improvement in individual components underlying core design concepts, and links between them, remain the same 	<ul style="list-style-type: none"> changes only the core design concepts without changing the product's architecture
	Changed	Architectural Innovation	Radical Innovation
		<ul style="list-style-type: none"> reconfiguration of an established system changes only the relationships between existing core design concepts link existing components in a new way 	<ul style="list-style-type: none"> establishes a new dominant design new core components that are linked in a new architecture

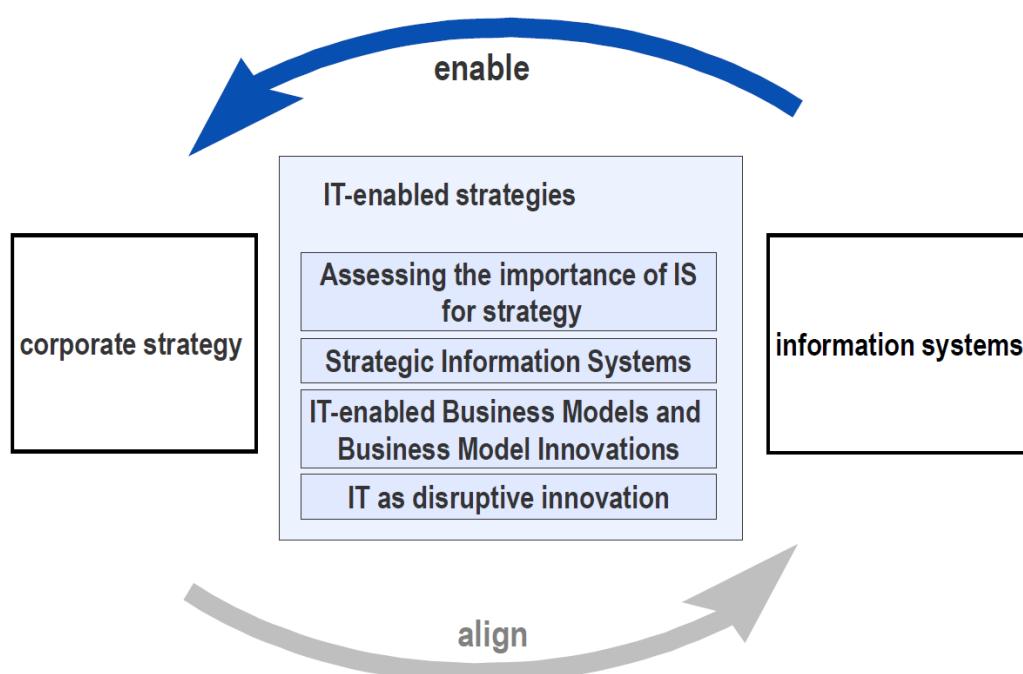
Henderson & Clark (1990)

- **incremental** e.g. online Arzt: Core components stay same still doctors appointment, same link: still talk to doctor only how different
- **modular** e.g. ATM instead of bank: core concept (banker interaction) replaced, linkage (withdrawal) the same
- **architectural** (amazon Go, flixbus: link different bus enterprises together & matching customers, concept: driving the same)
- **radical** (Rewe online: linkage: platform, concept: now also delivery)

Disruptive Innovation:

- pushing established technology/ business models out of the market
- not radical innovation
- **Christensen's Criteria** → it is not possible to forecast market disruption ex-ante (only indicators)
 - Historically most valued attributes (underperforms in old dimensions)
 - Other qualities (superior in dimensions not valued before)
 - Cost and margin (cheaper)
 - Simplicity (more convenient)
 - Interest of main customers (little interest of current leader's customers)
 - first customers (situated in niche or emerging markets)
 - first vendors (high rate of start-ups or companies new to market among innovative companies)
 - Value chain (different structure)
 - Market distribution (displace dominant in mainstream market)
- Uber disruptive? NO: served mainstream customers, quality of service caught on with mainstream qualities (improved)
- Tesla disruptive? YES

→ **disruptive, if all of Christensens' Criterias are met**



Lecture 5: Digital Platforms

Understand digital platforms & ecosystems

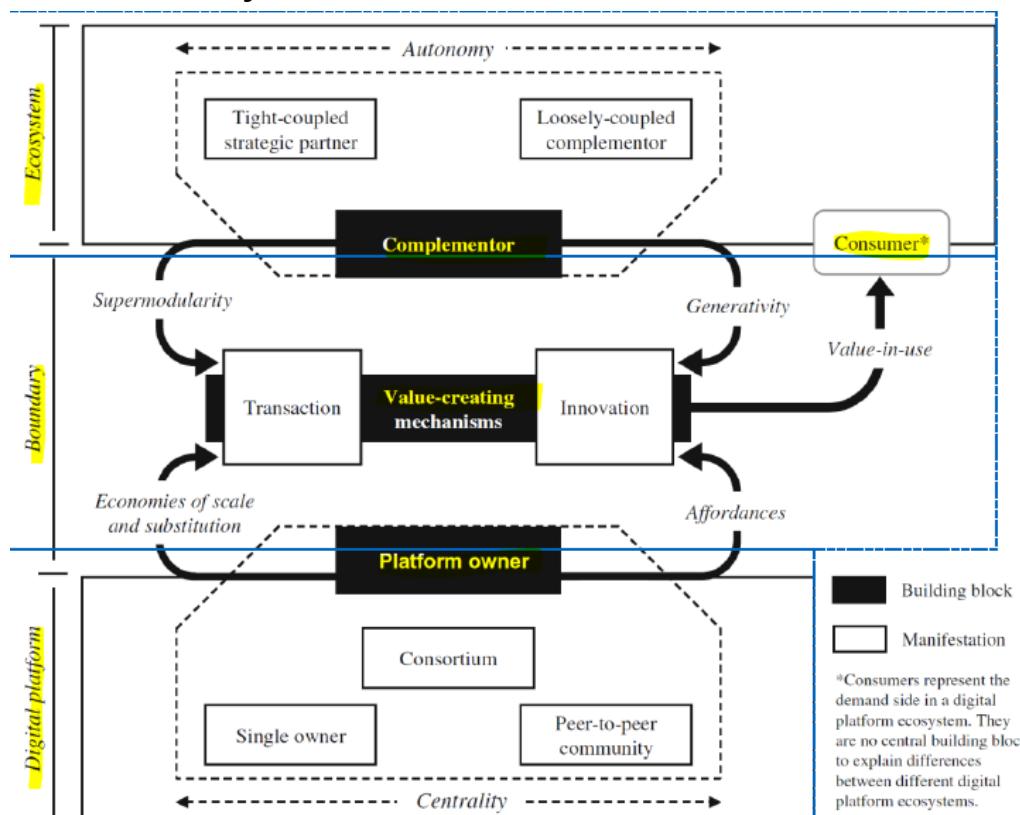
Platform:

- Importance: most top brands & startups have platform ecosystems as core or support
- business based on enabling **value-creating interactions** between external **producers and consumers**
- Key Roles (exchanging data & feedback):
 - **Producer** (of platforms offerings)
 - Provider & Owner (of Platform)
 - Consumer

Digital Platform:

- markets where user interactions are subject to **network effects** facilitated by a common platform
- platform provides open, **participative** infrastructure
- sets governance conditions
- combine and deploy (digital) technologies to coordinate an ecosystem of supply and demand
- extensible IT artifact that provides **core functionality** (access via interfaces)

Digital Platform Ecosystem:



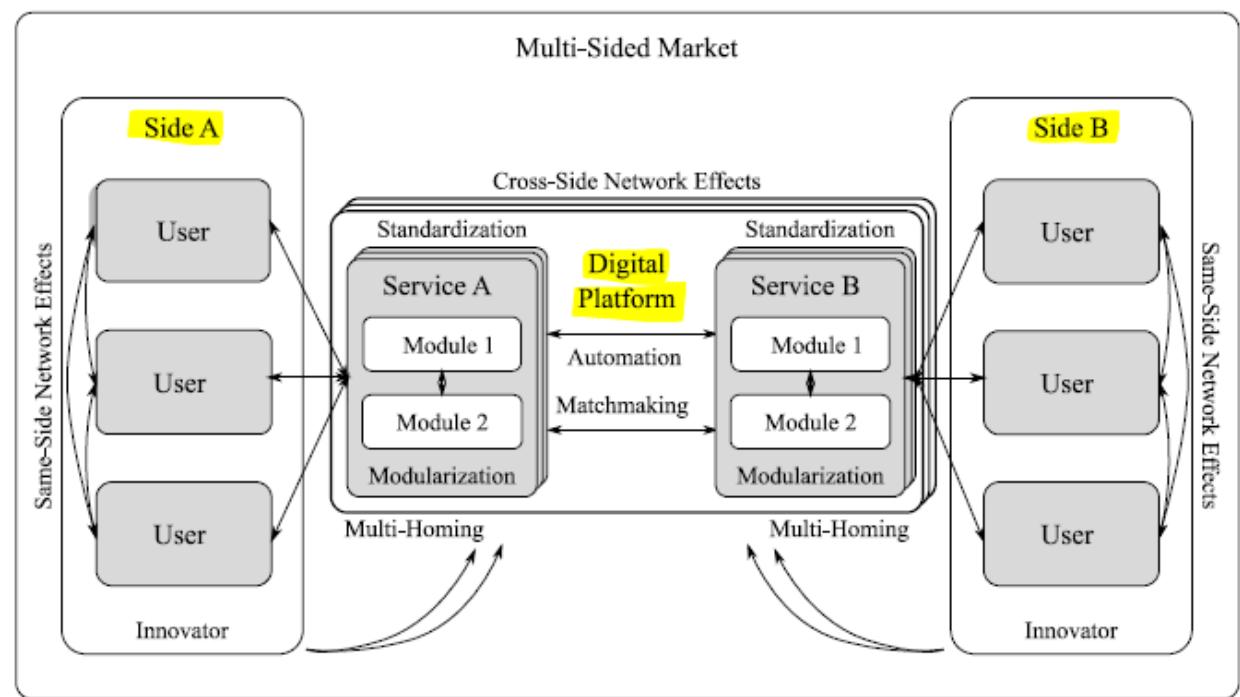
Platform ownership:

- factor of design & governance of digital platform ecosystems, defines relationships
- Distribution of power:
- **Single Owner**: single, central owner controls platform ecosystem
→ facebook, iOS, SAP cloud (act quickly)
- **Consortium**: group of actors own digital platform
→ cloud foundry
- **Peer-to-Peer community**: community (users) governs dig. platform
→ blockchain

Analyze characteristics of multi-sided market business models

Multi/ Two-sided Markets

- enable interactions between end users
- includes two independent groups of customers



- e.g. Credit cards: Consumer credit (Market 1), Issuing Bank (Intermediary), Merchant processing (Merchant processing)
- e.g. Recruiting Applicants ← Linked in → Employers

Characteristics Multi-sided BM:

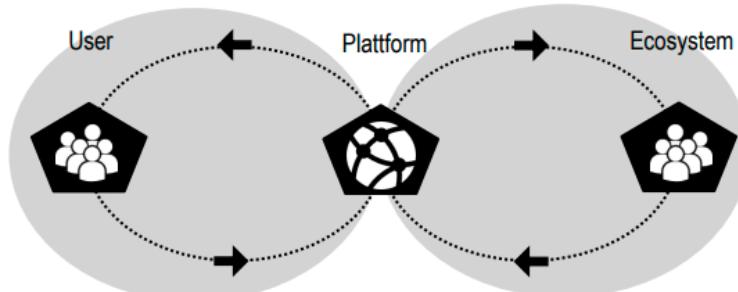
- **Network Effects**: *Tiwana (2014)*
 - Direct/Same-side (increase in usage → increased welfare of same side e.g. telephone)
 - Indirect/Cross-side (increased usage of one product → increase value of complementary product e.g. app store)

- **Launch Strategies:** *Parker (2016)* → each side depends on prior existence of the other side (indirect)
 - Follow-the-rabbit: build on existing success of non-platform “shops” (e.g. amazon’s own book sales)
 - Piggyback: connect with existing user base from other platform (e.g. PayPal piggybacked on eBay)
 - Seeding: create value units relevant to set of potential users (e.g. google awarded android app developers)
- Competition **Within** Platform Ecosystems (*Tiwana 2014*)
 - User level
 - Platform level (btw complementor and platform, e.g. Amazon Marketplace)
- Competition **Between** Platform Ecosystems (*Tiwana 2014*)
 - Platform level: interoperability vs exclusivity (iOS vs Android),
 - with strong network effects winner-take-all or winner-take-some markets
 - User level: Single- vs Multihoming (use Netflix & Disney+)
- Winner-take-all: *Parker (2016)*
 - supply-side economies of scale
 - strong network effects
 - high multihoming
 - lack of niche
 - e.g. Whatsapp

Understand value-creating mechanisms on digital platforms

Value Co-Creation

- Without platform: Value creation linear & determined
- With platform: Value co-creation process continuous follows virtuous cycle (bc NWEffects)



Parker (2016)

Platform value-creating mechanisms

- efficient & convenient facilitation of transactions
 - help complementors and consumers locate, interact and exchange value
 - acts as an intermediary by directly matching supply to demand
- provision of affordances making the digital platform a breeding ground for innovation
 - platform owners offer development tools for complementors
 - use boundary-resources to co-create value-adding complements
- **Supermodularity:**
 - increased amount of product A makes product B more valuable
 - A and B are different products (e.g. sell apps → value phone increases)
- **Generativity:**
 - capacity to produce unprompted changes driven by varied audiences
- **Economies of scale and substitution:**
 - Reusing modular components
- **Affordances:**
 - digital infrastructure build upon a modular software-based platform
 - reconfigure platform to adapt user needs and prompt new technological advances

Analyze 3 types of platforms governance & implementation

Platform Governance App Store: 3 dimensions

- **Decision rights partitioning:** provide autonomy
 - platform owner can transfer decision rights
 - *Platform* decision rights: whether owner & app developers make decisions pertaining to platform
 - *App* decision rights
 - 2 classes decision rights: Strategic & Implementation
- **Control portfolio design:** ensure integration (control development process of third- parties)
 - gatekeeping: who and what apps are allowed
 - process control: incentives to follow prescribed development methods
 - metrics: incentives based on predefined performance metrics
 - relational control (informal): norms & values of a platform
- **Pricing Policy:** Create Incentives to invest in own app
 - 4 questions: symmetric or asymmetric, pricing for access or usage, pie-splitting using fixed or sliding scale, app pricing
 - **Asymmetric:** subsidize one side, make up losses by increased profit from another

	Asymmetric Pricing <i>- market charges app developers</i>	Symmetric Pricing
Side 1 (App Developers) Money-Making	Symmetric Pricing	Asymmetric Pricing
	Money-Making	Money-Losing

Side 2 (End-Users)

- revenue sharing & subsidizing

Boundary Resources (BR) in Platform Governance

- Def.: resources that support developers in their effort; BR define interaction with platform; BR implement platform governance
- **Application:** Technical resources (e.g. support with Hardware, APIs)
- **Development:** Support dev. process (e.g. SDKs, IDEs, GUI)
- **Social:** Control interactions and behavior (e.g. automatic feedback app store, documentation, training)

Understand forms of complementor autonomy in platform ecosystems

Digital Platform Ecosystems

- **platform owner:** implements governance mechanisms
- to facilitate **value-creating mechanisms**
- on **digital platform**
- autonomous **complementors** and **consumers**

Ecosystem analogy

- reservoir of finite resources
- populations controlled by impulses (developer and user communities: variations)
- interactions between participating units (shared market)
- adaption of individuals and the system
- need for balance/adaption (higher diversity support a more stable equilibrium; ecosystem foster other areas when one market segment is obsolete)
- dynamics: top-down (one dominant firm), bottom-up (open source)

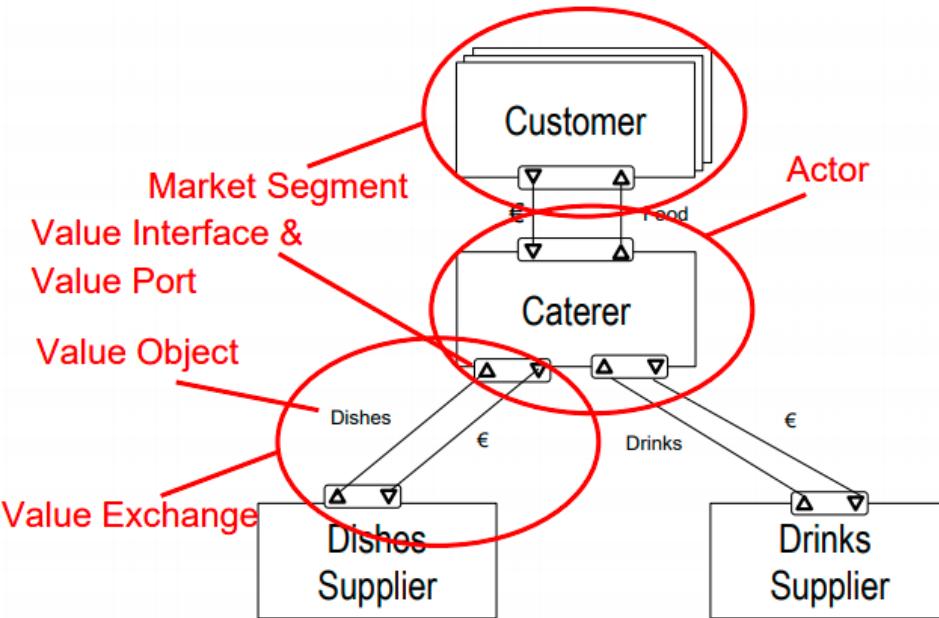
Ecosystem Integration

- **Tight Coupling:** mutual dependent elements, responsiveness (to changes) without distinctiveness (extent of differ)
- **Loose coupling:** independent elements, distinctive responsiveness, flexible scalability
- Decoupling: Distinctiveness without responsiveness

Complementor autonomy

- degree of freedom for complementors in value co-creation
- High: loosely-coupled (contribute to variety & amount)
- Low: tightly-coupled (strengthen core value proposition)

Apply E³- Value Modelling



Actor = independent economic unit

Market Segment = set of actors with equal value objects

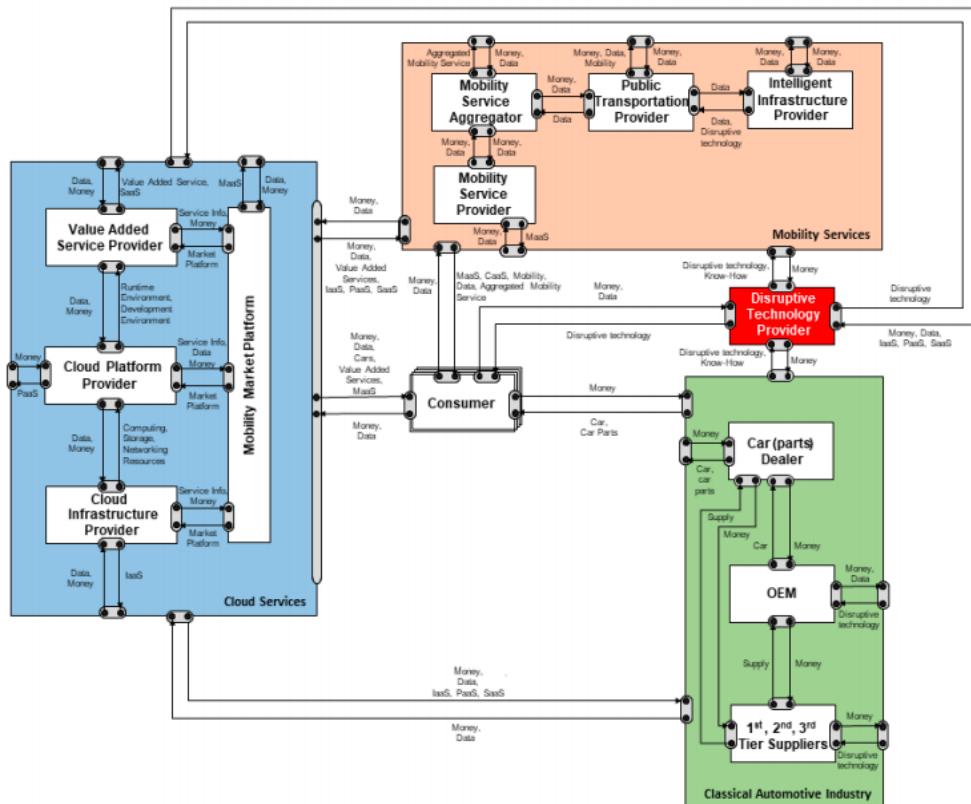
Value Object = object being exchanged between actors; represents value (money)

Value Port = supply/demand indicator for value objects

Value Interface = contains value ports; what is exchanged for what

Value Exchange = connection of two value ports; exchange relationship

Example:



Lecture 7: IT Controlling & IT Governance

Understand objectives of IT Controlling

Relationship IT Governance & IT Controlling:

- IT Governance : ensures final objectives are met
- IT Controlling: ensures critical success factors are met
- Design variables (e.g. Processes, IT) → **Success factors** (e.g. customer service, time to market) → **Objectives** (e.g. shareholder value) ← Competition, Economy, Regulations

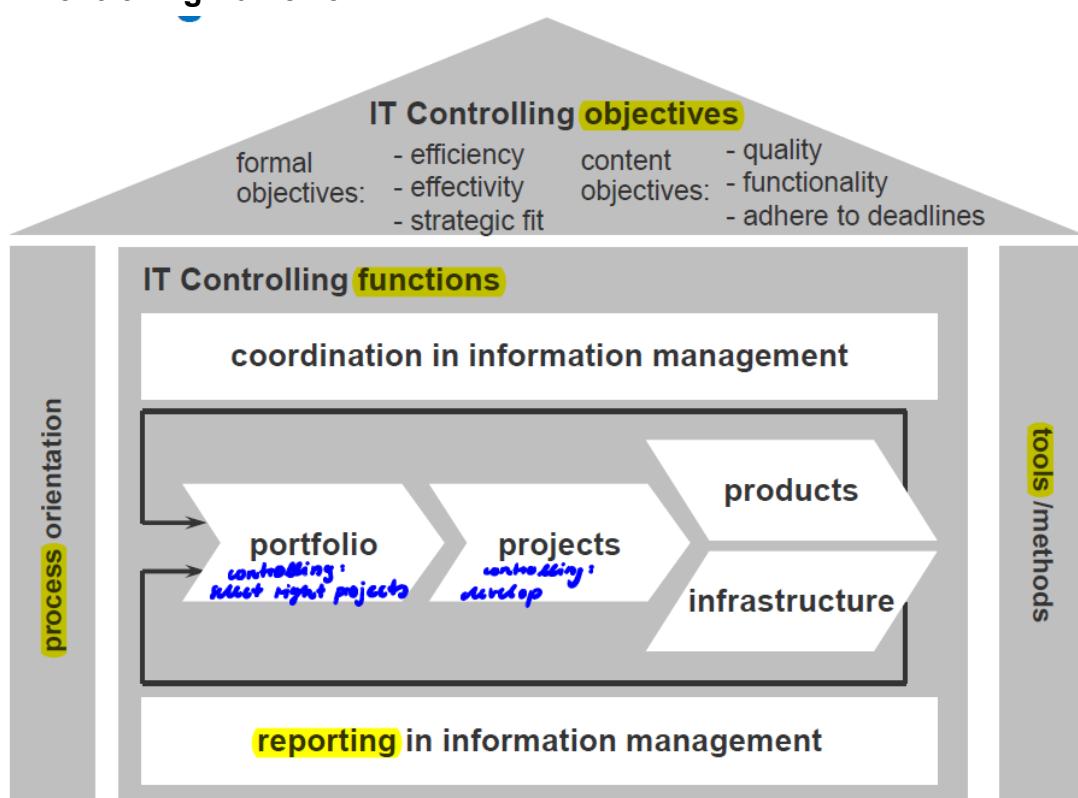
Controlling:

- management concept for future oriented corporate and profit controlling
- strategy for safeguarding corporate existence
- provides essential decision support

IT-Controlling:

- control IT of an organization
- formal objectives (efficiency, effectiveness)
- content objectives (quality, functionality, schedule adherence)
- also coordination function

IT Controlling framework

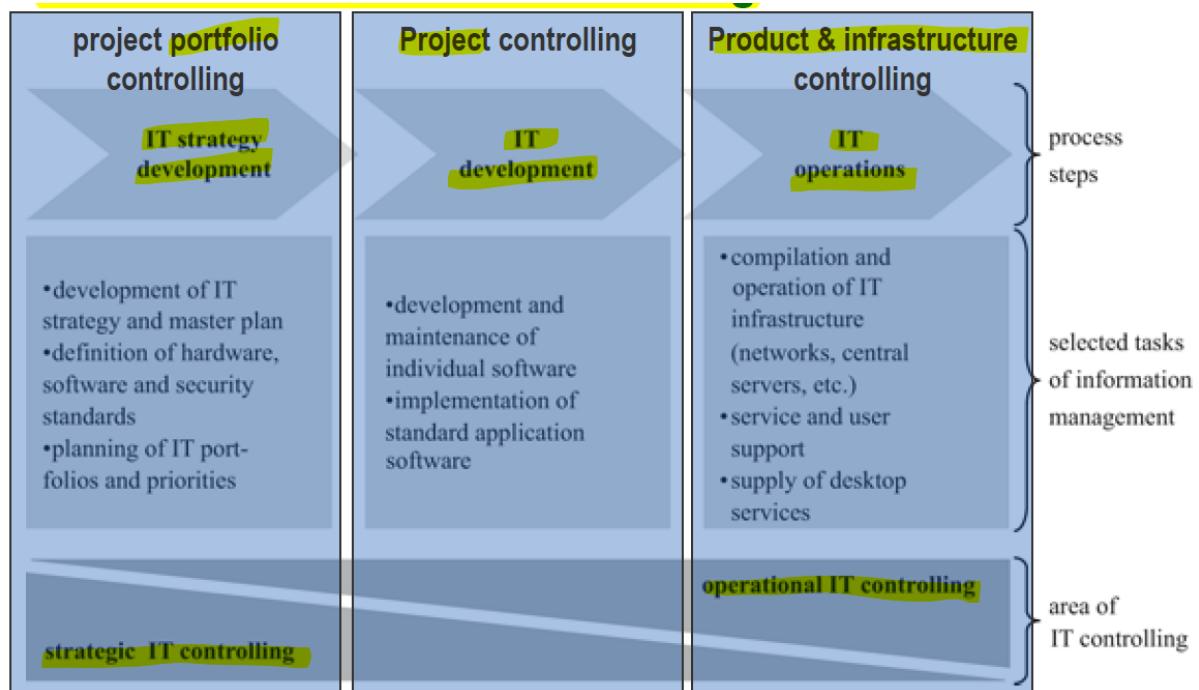


Understand, identify & differentiate functions of IT Controlling

IT Controlling functions:

- **Project portfolio controlling:** Make selection of fitting IS project transparent
- **Project controlling:** execute projects correctly (plan, manage, monitor costs, schedules, services)
- **Product and infrastructure controlling:** Monitoring of product use through product life cycle (handle operation)

IT Process Model



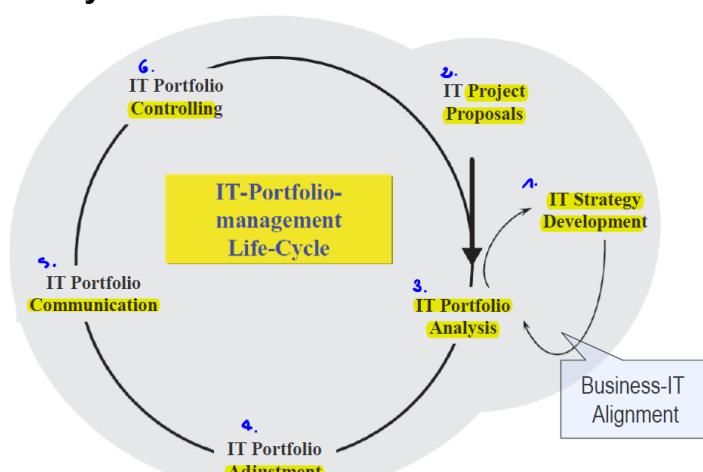
Gadatsch (2009)

Know & understand methods of IT Controlling

1. Strategic:

Project portfolio controlling:

- **Life-cycle:**



Gadatsch & Mayer (2014)

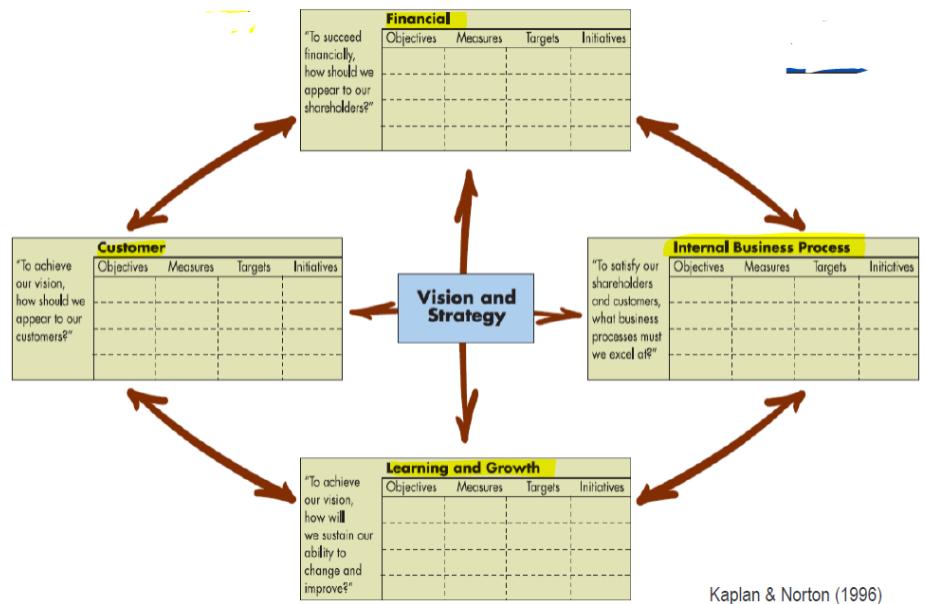
- **Selection Criteria:**

- Benefits: Financial/Non-Financial (e.g IT advantages)
- Simplicity of Implementation: Project Risk / Project Complexity

Project, product & Infrastructure controlling:

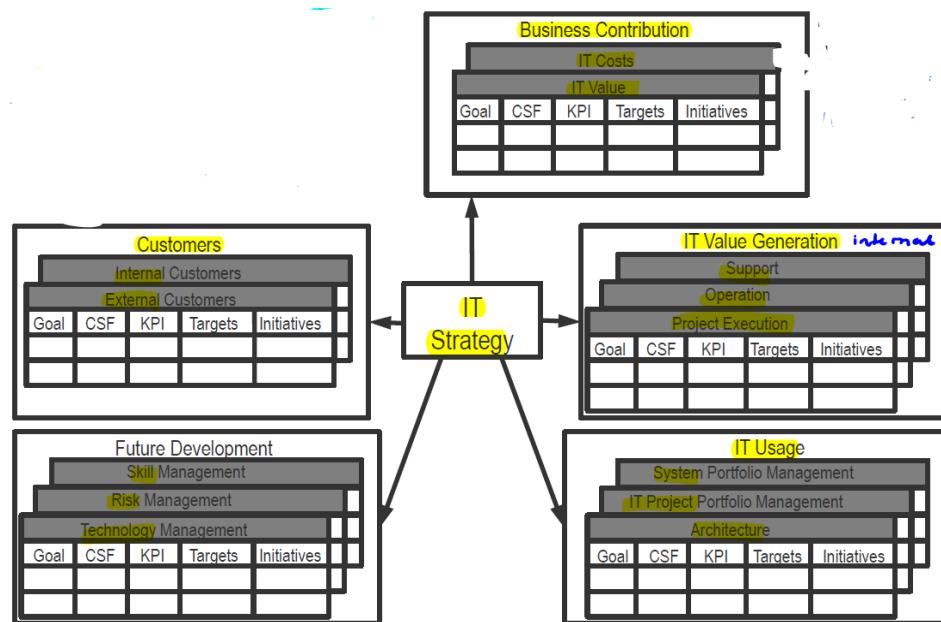
Balanced Scorecard:

- Performance measurement framework, translates organizations strategy to set of performance measures



Balanced IT Scorecard

- **CSF**: Critical Success Factor, vital for strategy, not measurable
- **KPI**: Key Performance Indicator, measurable



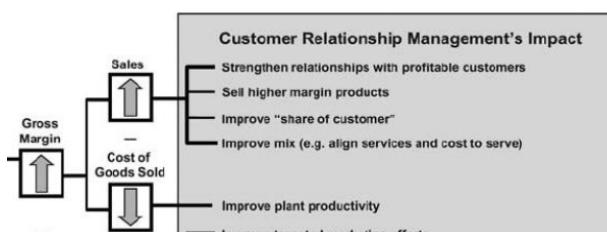
2. Operative:

IT project controlling:

- Cost: estimation (function point analysis or COCOMO), reporting
- Time: milestones, Gantt Chart
- Quality: quality gates, customer reviews

Metrics System:

- Metric = quantitative judgement on planned or actual value of a criteria of a steering object
- types: steering, information, benchmarks, quantitative/qualitative
- Domain with Top metric gives objectives for sub-domain, subdomain gives measurement of metrics for top-domain (KPI to calculate other KPI)
- e.g. Economic Value Added



Lambert (2008)

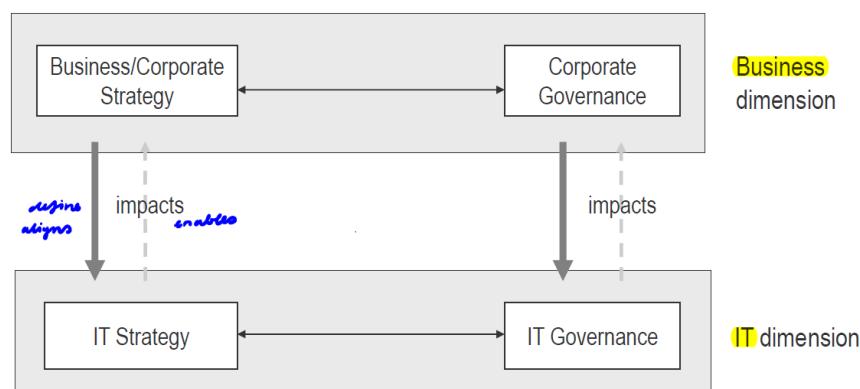
- arrow up: more, down: less

Understand IT governance and its relation to corporate governance

Corporate Governance:

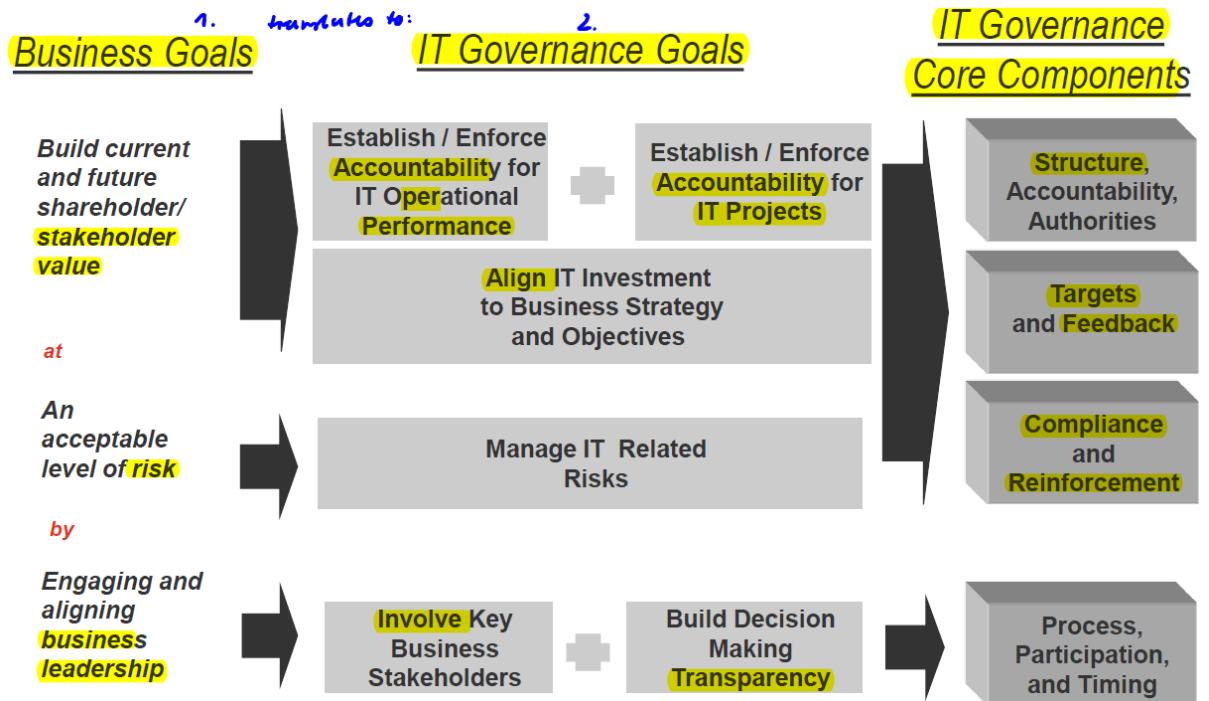
- corporate virtues (for **shareholders**): limiting liability of investment, buy & sell ownership interests easily
- Potential misalignment of interests between shareholders and managers → **separation of ownership and Control**
- system which directs and controls business corporations
- structure specifies distribution of rights and responsibilities among different participants (board, manager, stakeholders)
- define rules and procedures for decision making on corporate affairs
- provides structure to set company's objectives and monitor performance

Corporate Governance & IT Governance



IT Governance

- represents framework for **decision rights & accountabilities**
- **encourage desirable behavior** in the use of IT
- systematically determine who makes decision (decision right), who has input to a decision (input right), and how these people are accountable for their role
- Design:



→ Good IT governance draws on corporate governance principles to **manage and use IT to achieve corporate performance goals**

Understand COBIT 2019

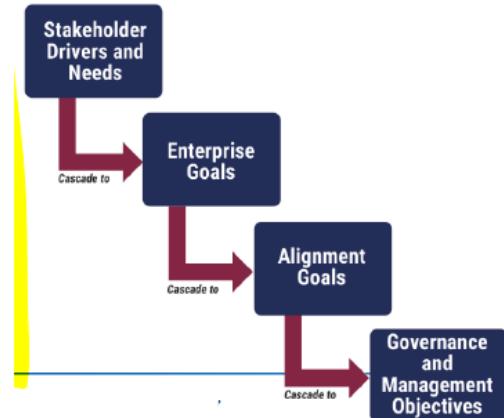
COBIT:

- Control Objective for Information and related technology
- Framework for **governance & management** of enterprise information & technology
- Defines **7 Components** to build & sustain governance system
 - which decisions, how, by whom?
- defines design factors
- governance & management objectives
 - No silver bullet, need to **tailor**

COBIT Principles 2019

- Provide Stakeholder Value:

- governance needed to satisfy stakeholder needs, to generate value
- value is balance among benefits, risk and resources
- need actionable strategy governance system to realize value



- Holistic Approach:

- governance system for enterprise IT is built from number of components that can be of different types and work together in holistic way
- categories of enablers:

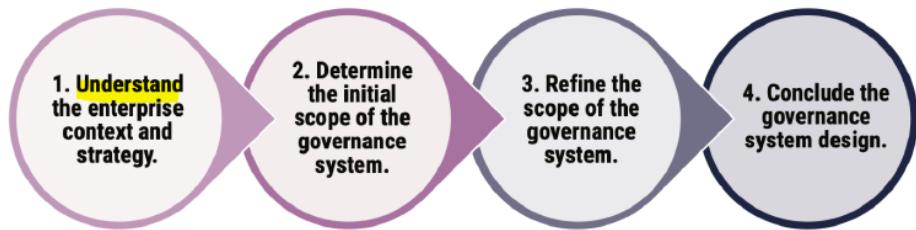


ISACA (2019)

- Dynamic Governance System:

- when design factors changed, need to consider impact on enterprise governance
- dynamic for future-proof system

- **Governance distinct from management:**
 - clearly distinguish between governance and management activities
 - **Governance:** stakeholder needs, balances & agreed-on enterprise objectives; direction set through prioritization and decision making; monitor performance and compliance against agreed-on direction
→ responsibility of board of directors
→ Evaluate, Direct and Monitor (EDM)
 - **Management:** plans, builds, runs, and monitors activities; in alignment with direction set by governance body; achieve enterprise objectives
→ responsibility of executive management (CEO)
→ Align, Plan and Organize (APO); Build, Acquire and Implement (BAI); Deliver, Service and Support (DSS)
- **Tailored to Enterprise Needs:**
 - tailor by using set of design factors
 - Governance system design workflow



- **End-to-End Governance System:**
 - governance should cover enterprise end-to end
 - focus on all I&T processing to achieve goal
 - emphasis on enterprise-wide view of I&T governance
 - impossible to separate business & IT (integral part of enterprise governance, cover full end-to-end business and IT functional areas)

Lecture 8: IT Sourcing and IT Offshoring

Discuss reasons & risks of outsourcing from client and vendor perspective

“The reason that we want someone else to do work for us is that they are experts”

Outsourcing

- = outside + resource + using
- execution of certain in-house tasks are completely transferred ...
 - ... to one/several external companies
 - ... for certain period of time
 - ... based on conceptual agreements
- IT context: single or whole IT-tasks are given to another company
- **make or buy ?**

Client Perspective - Reasons/Benefits

- **Cost:** transparency (pay per use); cost reduction
- **Personnel:** avoid lack of qualified IT-employees; more independent from single employees
- **Risks:** transfer risk to outsourcing vendor; shift of risks from complexity in application and technology dynamics
- **Concentration:** IT focus on business value and strategic information systems
- **Finances:** from fixed to variable costs (increased liquidity); avoid high investments
- **Knowledge:** access specialized knowledge & novel technology; more discipline in knowledge conservation (documentation)

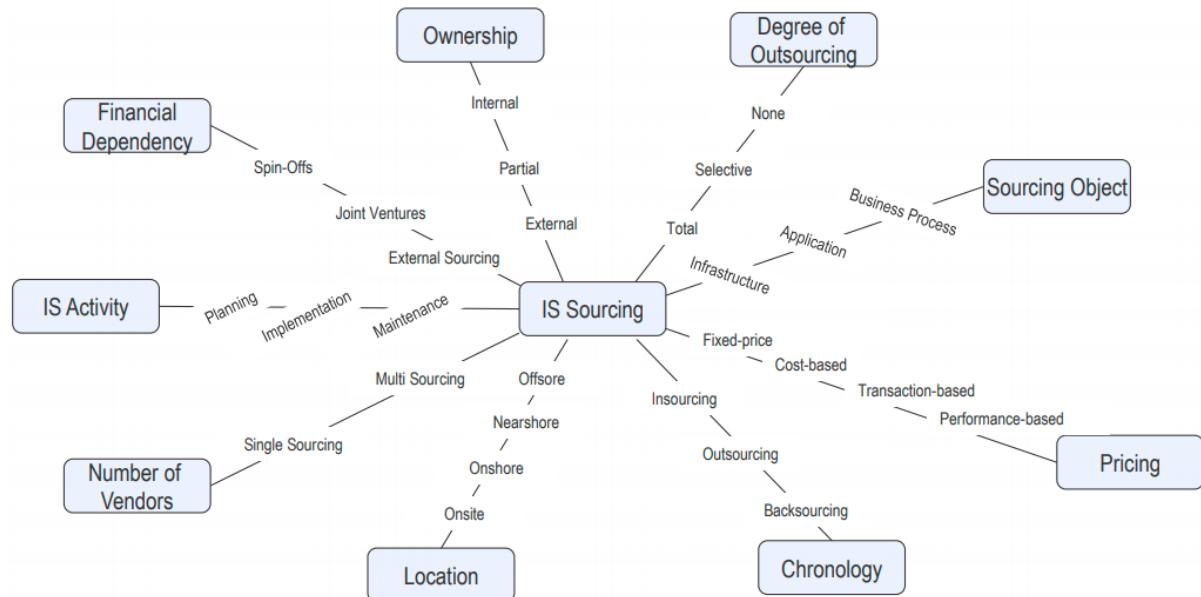
Client Perspective - Risks

- **Cost:** switching cost; increased coordination & communication cost; no cost reduction as expected; lack of transparency; impossible to control vendors' prices
- **Personnel:** loss of key employees & knowledge; motivation loss of remaining IT-employees; legal issues
- **Knowledge:** know-how transfer; competitive advantage; increasing outsourcing results in loss of IT-competence and know-how
- **Technology:** fixed commitment to vendor's technology (vendor lock-in); danger of too much standardization
- **Privacy:** maintain privacy of confidential data dependent on vendor
- **Return to own IT:** might not be possible (long-term commitment of contracts); rebuild know-how and whole IT department

Vendor Perspective

- higher quality services can be provided at lower cost (maintain expertise in technologies)

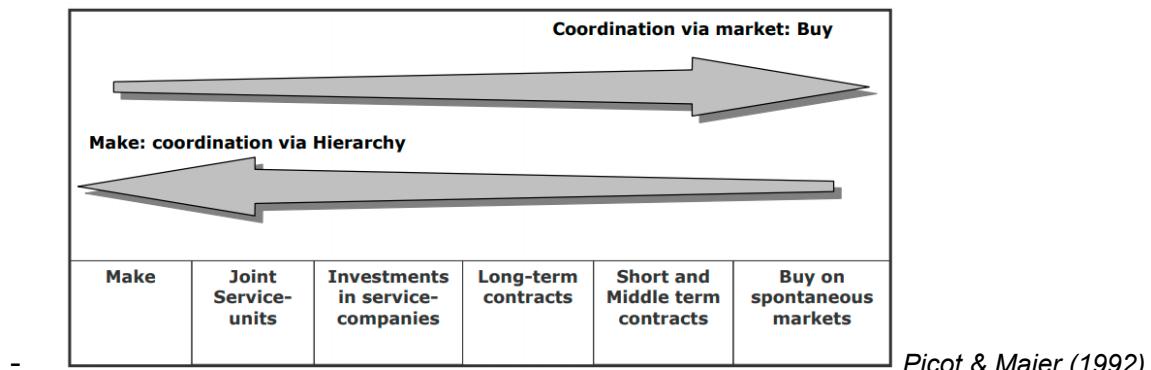
Differentiate outsourcing agreements building on outsourcing configurations



Leimeister (2009) & von Jouanne-Diedrich (2007)

Financial Dependency

- institutional continuum



Picot & Maier (1992)

Degree of Outsourcing, Ownership, Financial dependency

- Backsourcing: bring previously outsourced jobs back to perform internally
- Insourcing: assign project/subsidiary within company rather than hiring a third party
- Outsourcing: individual internal tasks are handed over to one or more other companies for a period of time (contract)

Degree of outsourcing	Ownership		
	<i>Internal</i>	<i>Partial</i>	<i>External</i>
Total	Spin-offs (fully owned subsidiary)	Joint-Venture	Traditional Outsourcing
Selective			Selective Sourcing
None	Insourcing / Backsourcing	Facilities Sharing among multiple clients	N/A

Dibbern (2004)

Sourcing Object

- ca. 1960-80: IT Infrastructure Outsourcing (ITO) → Hardware/Software
- ca. 1980-90: Application Service Providing (ASP) → Applications
- since 1990: Business Process Outsourcing (BPO) → Business functionality
- in the beginning more **maturity** and **experience**, later more **complexity**
- **core competencies to retain** in own company:
 - development of strategy & architecture
 - establishment of standards
 - capability to evaluate outsourcing options
 - repository of all installed applications and hardware
 - consultancy on cost/benefit, strengths/weaknesses, risks/potential of IT
 - evaluate architecture fit of new hardware/software
 - monitor old systems (+ retirement, replacement)

→ exp: deutsche bank & IBM (management Teil komplett bei Deutsche Bank)

Vendor Configuration

- different Customer-Vendor-Relationship (e.g. Number of vendors, which services, part-inhouse)

Pricing

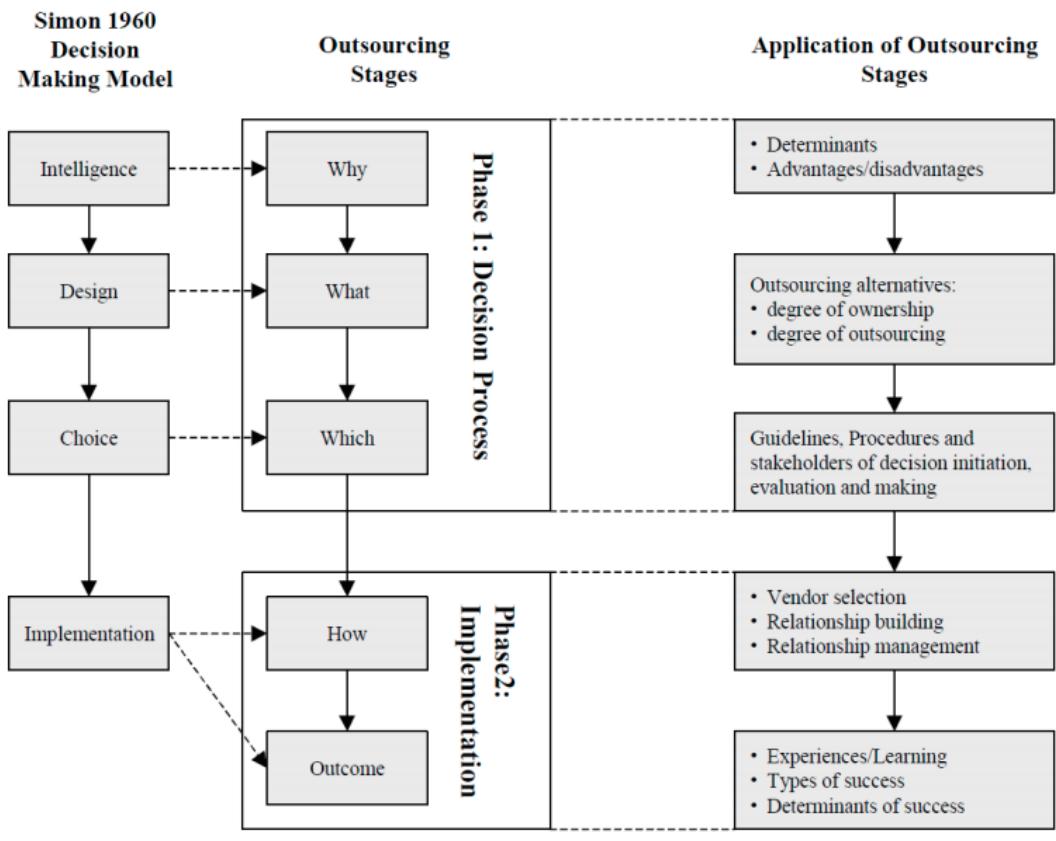
- Fixed-Price
 - service priced with a flat charge (lump sum)
 - **Pro:** easy to budget and control costs
 - **Contra:** only feasible if costs are easy to forecast; higher costs; risk for conflicts (contract); additional services charged separately
 - e.g. 2.000.000€ for running call center
- Cost-based
 - service provider bills cost (Time & Material) + profit margin
 - **Pro:** beneficial if demand varies and if service delivery costs are difficult to forecast
 - **Contra:** high controlling costs to ensure cost-efficient work; important to know service provider costs
 - e.g. service cost + 5% profit margin / + 1.000.000€ profit
- Transaction-based
 - service fee per transaction or unit
 - **Pro:** flexibility regarding demand variance; possibility for volume discounts; cost transparency and accountability (user, SBU)
 - **Contra:** demand forecast to manage costs; potentially infinite resource availability
 - e.g. 5€ per call to call center
- Performance-based
 - pricing based on pre-agreed business outcome (fixed+variable)
 - **Pro:** encourages collaboration and creative problem-solving; affords vendor greater freedom in achieving the predefined results
 - **Contra:** hard to determine performance (external factors); hard to find service vendors for high objectives; high downside risk of over-ambitious solutions (risk-sharing)
 - e.g. 5.000.000€ + 30% of costs saving to status quo

Location

- Headquarter
- Onsite: on own company premises
- Onshore: same country
- Nearshore: same continent
- Offshore: other country or continent

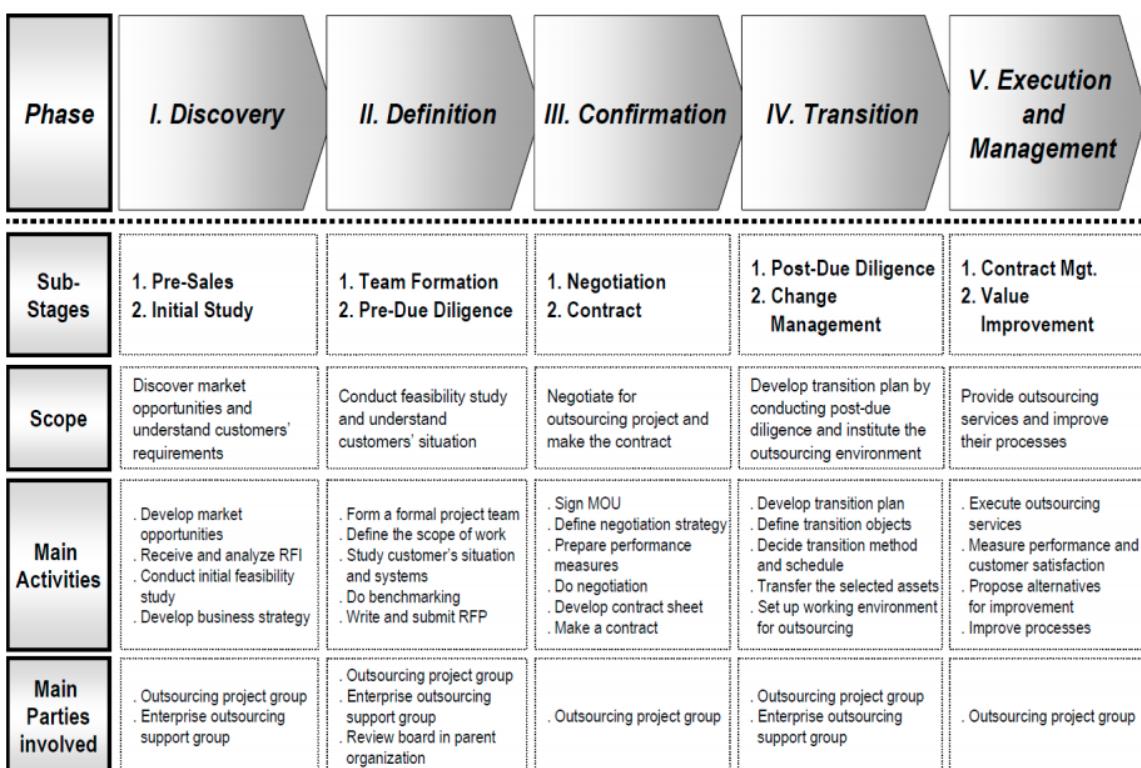
Understand steps for outsourcing from client and vendor perspective

Client Perspective - Stage Model



Dibbern (2004)

Vendor Perspective - Process Model



Lee (2008)

Discuss cloud computing and its relation to outsourcing and understand different types

Cloud Computing

- IT deployment model
- based on virtualization
- resources (infrastructure, applications, data) deployed via internet as distributed service
- one/several service providers
- services scalable on demand & priced on pay-per-use

Types *Armbrust (2009)*

- Private Cloud within Organization A
- Public Cloud includes Organizations A,B and C
- Hybrid Cloud within Organization A combined with Public Cloud (A,B,C)
- Community Cloud with Organization A,B and C within a Community

→ Cloud Computing can lead to complex outsourcing relationships

Discuss IT offshoring and its relation to outsourcing: understand drivers and risks

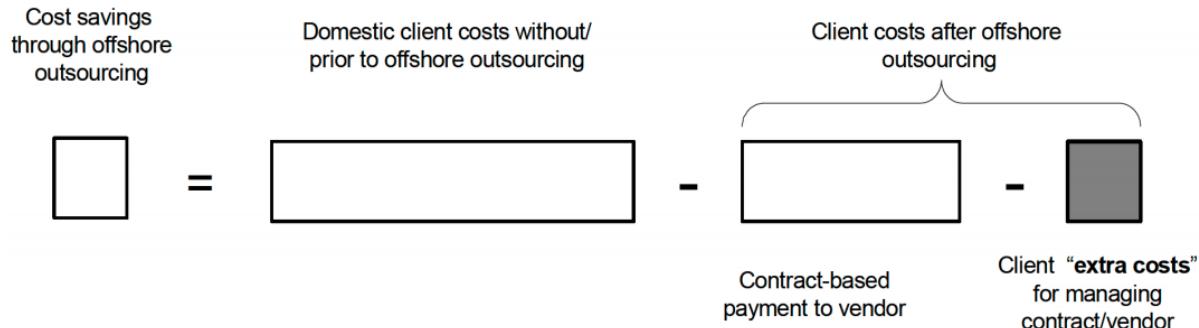
	Offshoring	Outsourcing
Definition	getting work done in a different country/continent	contracting work out to an external organization
Risks	<ul style="list-style-type: none">- transfer jobs to other countries- geopolitical- language differences- poor communication	<ul style="list-style-type: none">- misaligned interests of clients and vendors- reliance on third parties- lack of in-house knowledge (critical business operations)
Benefits	<ul style="list-style-type: none">+ lower costs+ availability of skilled people (global talent pool)+ getting work done faster	<ul style="list-style-type: none">+ specialized skills+ cost efficiencies+ labor flexibility

Offshoring Drivers

- External:
 - lower trade barriers
 - global offering of services
 - significant labor cost advantages in offshore regions
 - real-time global collaboration (communication technologies; internet)
- Internal:
 - shorter product life cycles (time-to-market)
 - limited IT budgets (cost reduction)

- higher IT-service standards
- increasing experience in IT outsourcing

Interpret possible client extra costs in offshoring

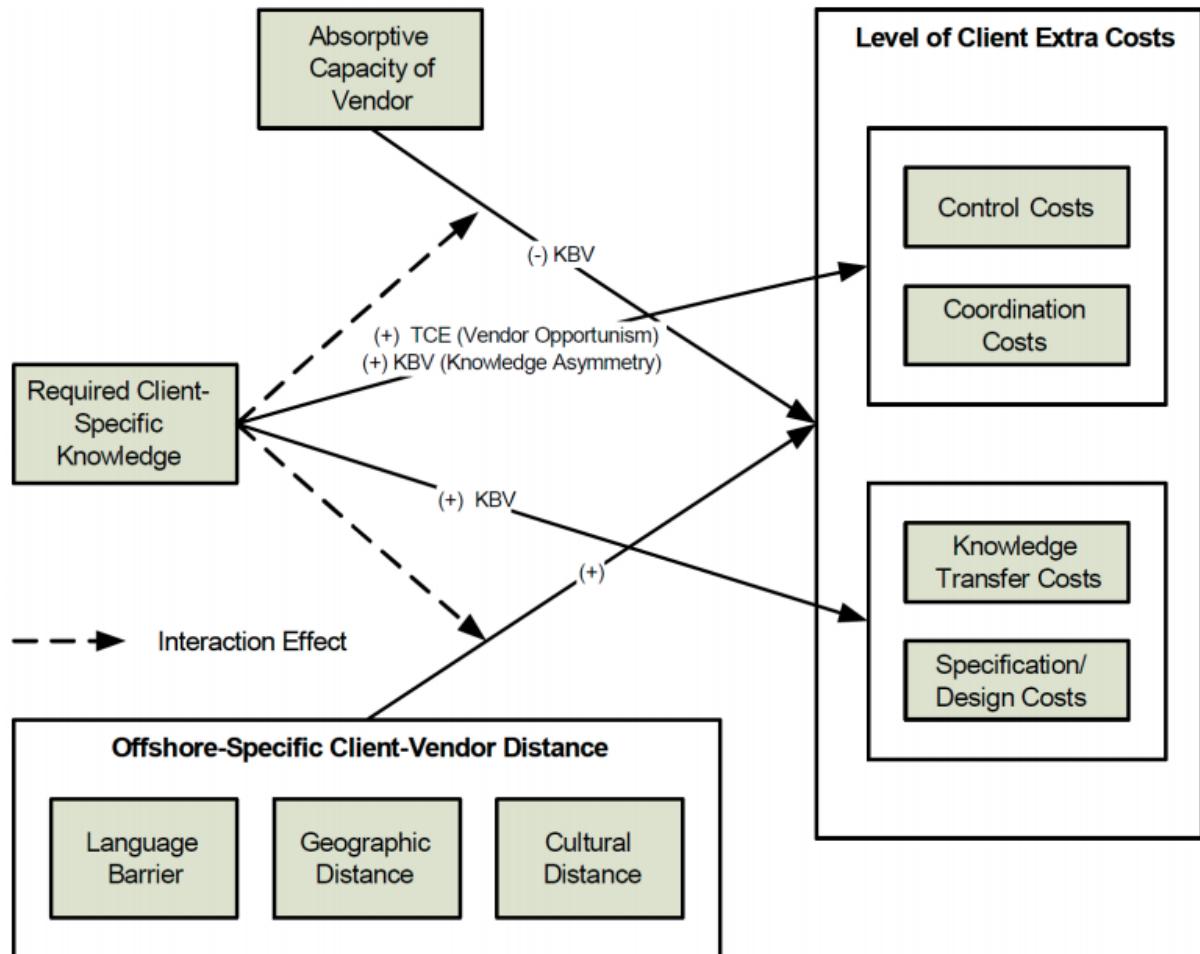


		Degree of Client-Specific Knowledge		
		High	Medium	Low
Level of Absorptive Capacity of Vendor	High	Medium level of extra costs	Low to medium level of extra costs	Low level of extra costs
	Medium	Medium to high level of extra costs	Medium level of extra costs	Low-medium level of extra costs
	Low	High level of extra costs	Medium to high level of extra costs	Medium level of extra costs

Dibbern (2008)

Cost Categories

- **Specification:**
 - explain & define what services are required
 - identify constraints on system operations and development
- **Design:**
 - describe software structure (data, interfaces, algorithms, ...) to be implemented
- **Knowledge transfer:**
 - communicate knowledge from client to vendor organization
 - vendors apply knowledge
- **Coordination:**
 - integrate and link together client and vendor resources
 - accomplish collective set of tasks
- **Control:**
 - ensure vendors' actions
 - should be consistent with achieving client's desired objectives



- KBV: Knowledge asymmetry: gap btw client-spec knowledge needed to understand by vendor & vendor can understand, TCE: Client wants to make more money
- **drivers extra costs**: Needed client-specific knowledge, absorptive capacity, distance

Lecture 9: Information Security, Privacy & Risk Management

Understand Information Security

Security

- absence of unbearable risks

Risk

- RE (risk exposure) = probability(adverse future event) * magnitude(event)
- RRL (risk reduction leverage) = $(RE_{before} - RE_{after}) / \text{cost of intervention}$
- probability that particular adverse event occurs during stated period of time
- event results from a particular challenge

Information

- information that companies collect , store, manage and transfer
- organizational asset
- adds value to business
- needs to be protected
- often held electronically
- transmitted using electronic means

→ Growing dependence on information systems, shared networks and distributed services (cloud computing)

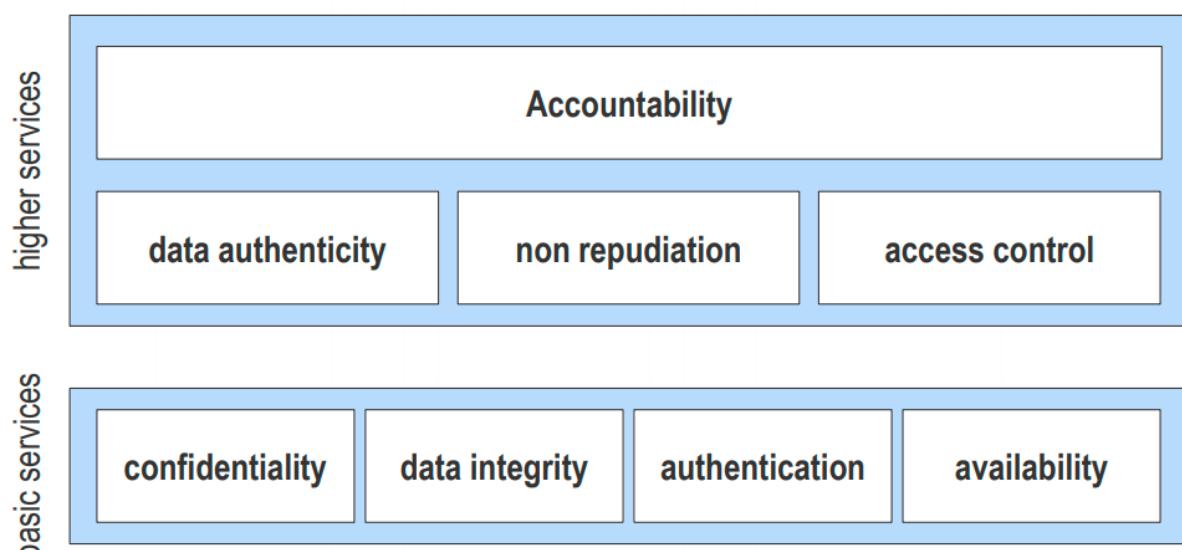
→ organizations more vulnerable to security threats

Information Security is the practice of defending information from ...

- ... unauthorized access
- ... use
- ... disclosure
- ... disruption
- ... modification
- ... inspection
- ... recording
- ... destruction

→ general term used regardless of the form the data may take

Understand & distinguish IT security objectives



Eckert (2009)

Basic services

- **confidentiality**: information **not available or disclosed** to unauthorized individuals, entities, processes (no write, read)
 - **encryption** of stored and transmitted data
 - access control
 - notification in case of data breach

- **data integrity**: data has **not been altered or destroyed** in unauthorized manner (no write)
 - **hash-functions**
 - back-ups
 - access control (email signatures, transmission certificates)
 - validating inputs
- **authentication**: verify identity
 - user's access credentials (**password**, fingerprint, chip cards)
 - certificates
- **availability**: reliable access at the right time on information and IS
 - data/server replication
 - redundancy
 - load balancing
 - SLAs with external/internal providers

Higher services

- **accountability**: trace activities on a system to individuals who may then be held responsible for their actions
 - auditing & **logging**
 - cross-department collaboration
 - cybersecurity awareness training (legal standards)
- **data authenticity**: data being genuine and able to be verified and trusted; confidence in validity of data itself and its authorship
 - **certificates** for the website
 - keyed-hash message authentication code (HMAC)
- **non repudiation**: way of guaranteeing that message sender cannot deny having sent a message
 - message authentication codes
 - digital **signatures**
 - auditing & logging (time-stamp, verify registrations)
- **access control**: granting authorized entities to use information, while preventing access to non-authorized entities
 - definition of **roles**, attributes or rule

Understand privacy and discuss key changes of the GDPR

Privacy

- “contextual integrity”
- sharing information outside of socially agreed contextual boundaries
- **decision privacy**
 - about person's decisions and choices
 - private actions
 - protect persons decisions from external interferences

- **information privacy**
 - ability of a person to control, edit, manage and delete information about themselves
 - decide how and to what extent information is communicated to others

Impacts and Issues

As data can be stored and processed in the “Exabyte” level and more connectivity and interaction is possible, information is ubiquitous.

Threats

- Internet
 - use of cookies to store online behavior
 - cloud computing: access data and usage statistics (vendor), ambiguities regarding legal issues
- Big Data
 - profile users, identify patterns and predict interests & behavior
 - eventually result in future discrimination and inequalities
- Social Media
 - steering users' behavior of sharing (like-button)
 - “fake” news vs. user generated content
 - privacy features only as build-in ‘add-ons’ rather than by design
 - exchange personal data for the benefits of using services
- Internet of things
 - automatic adaption of environment to user
 - usage of explicit preferences and implicit observations
 - user autonomy as central theme in considering privacy implications

EU General Data Protection Regulation (GDPR)

- applied EU-wide since May 25 2018 in national data protection laws
- aim: giving control over personal data

key changes

- increased territorial scope
- penalties
- consent
- breach notification
- right to access
- right to be forgotten
- data portability
- privacy by design
- data protection officers

Data protection law in Germany

- GDPR
- Federal Data Protection Law (Bundesdatenschutzgesetz)
- state specific protection laws (BayDSG)
- area specific regulations (telecommunications act, ...)

Discuss risk with its categories and two strategies

Risk (cf. first section)

- is neither good or bad → it's just a fact
- some projects involve more risks than others
- invest in high risk projects when the return is high, BUT not all assets

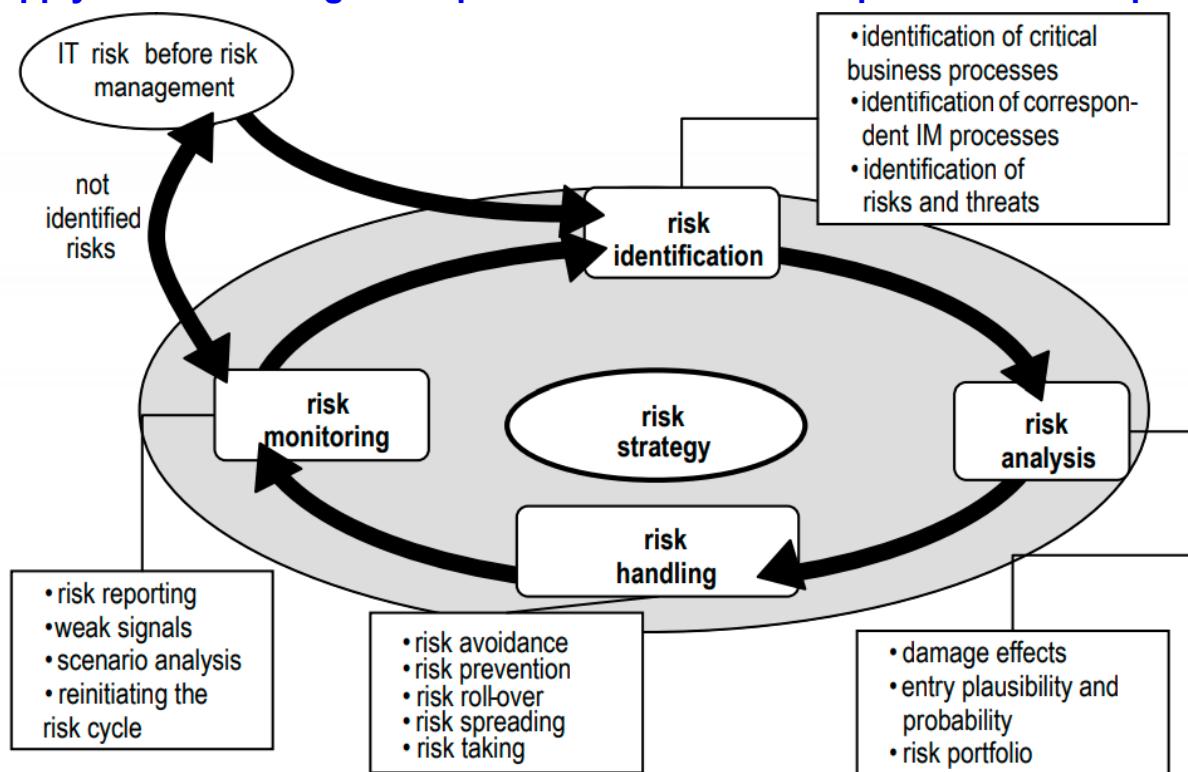
Risk categorization

- **known** risks:
 - can be **uncovered**
 - carefully **evaluate** project plan, business and technical environment of project
 - inspect other reliable sources
- **predictable** risks:
 - **extrapolated/hochrechnen** from past project experiences (past turnover)
- **unpredictable** risks:
 - can and do occur
 - **extremely difficult to identify** in advance (zero-day attack)

Risk Strategies

- **Reactive:** "don't worry, I'll think of something"
 - nothing is done about risks until something goes wrong (fire fighting)
 - crisis management
 - often used
 - **Proactive:**
 - avoid risk
 - contingency plan to handle unavoidable risks in a controlled manner
- find balance between risk occurring and the maximum bearable damage
→ pareto principle: optimize situation without worsen any other component
→ diminishing marginal benefits: the higher the level of security every additional effort only increases security a little bit more

Apply the risk management process and know examples for each step



Krcmar (2015)

Risk Identification

- transfers uncertainties in a set of **clearly defined risks**
- tools: expert interviews, brainstorming, analogies, risk registers

Risk Analysis

- **assesses identified risks** regarding their ...
 - ... probability of **occurrence**
 - (negative) **impact** on the project/organization
- tools: expert interviews, cause-and-effect analysis, decision trees, threat tree

exp: threat tree

- summarize potential threats in a top-down view
 - leaves are threatened goals
 - division in subtrees (AND, OR relations)
- Goal: find weakest link based on attack costs

Risk Handling

- evaluates, plans, and executes **strategies** for the analyzed risk
- tools: risk strategy list, decision tables/trees, cause-and-effect analysis

exp: risk strategy list

- avoid ...
 - ... poor estimating, scheduling & planning
 - ... ineffective stakeholder management

- ... insufficient risk management
- ... shortchanging quality assurance
- ... weak personnel and/or team issues
- ... insufficient project sponsorship

Risk Monitoring

- **tracks risk evolution** over time
- tools: status reports, to-be analysis, risk visualizations

Understand and apply the three characteristics of IT project risks

1. Project Size

- measurable in workers/years of **effort**
- interpersonal **communication** (exponential growth with team size)

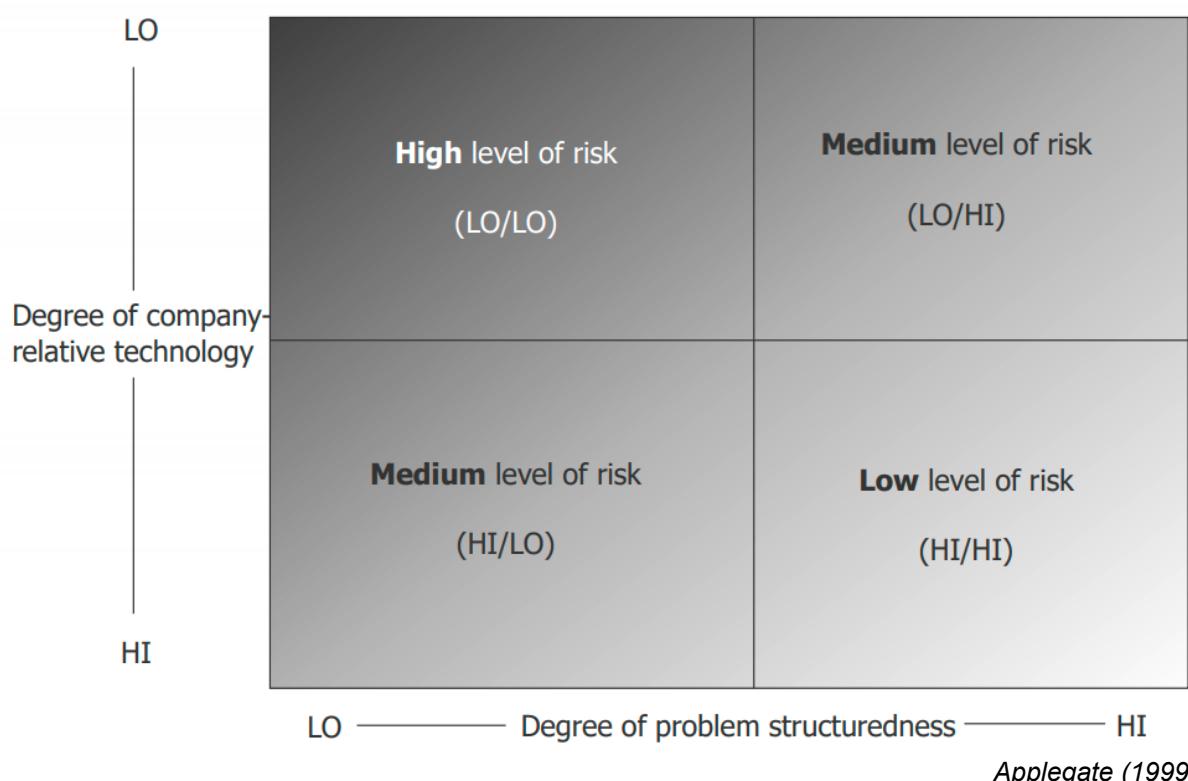
2. Company-relative technology

- degree of **technical experience**
- education/familiarization **costs for new things** (tools, concepts, hardware, software, communication, ...)
- expect unexpected (unplanned) interface problems

3. degree of inherent structure

- well-defined project outputs ?!
- Do developers understand what is requested (implement)?
- have they already built a system like this before?

IT project risk framework



Lecture 11: Basics & Tools of Knowledge Management

Understand and distinguish basic terms of KM

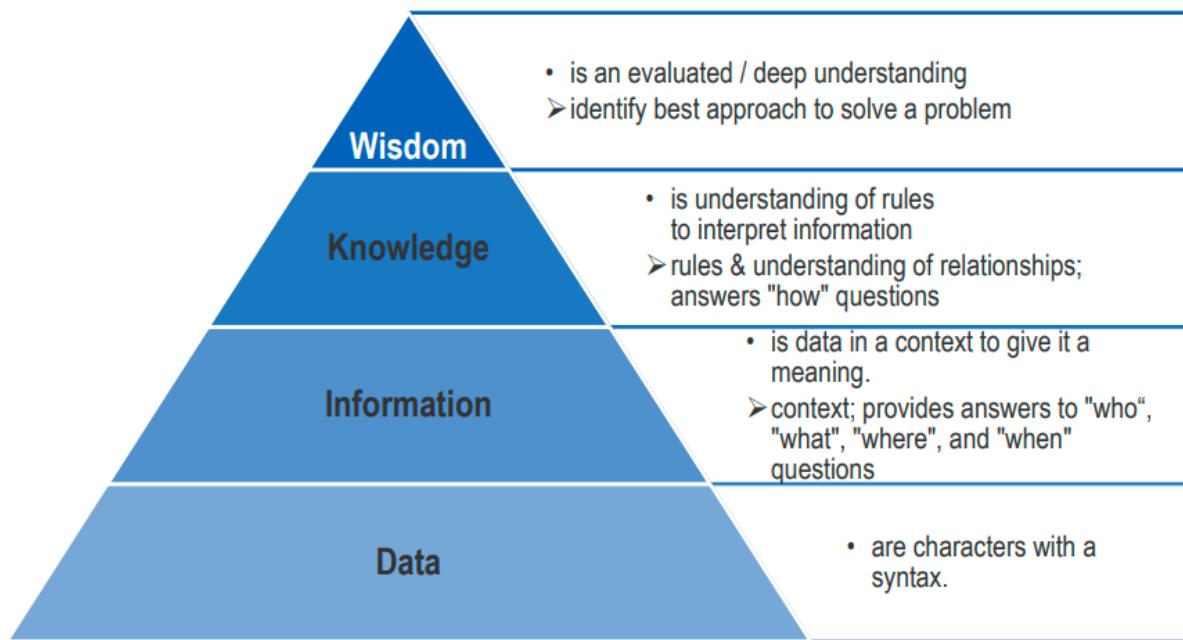
“In an economy where the only certainty is uncertainty, the one sure source of lasting competitive advantage is knowledge!”

Knowledge economy

- organizational **performance** dependent on the production, diffusion, and use of knowledge.

Knowledge-based firm theory

- knowledge is the major source of competitive advantage of a firm



Ackoff (1989)

Knowledge

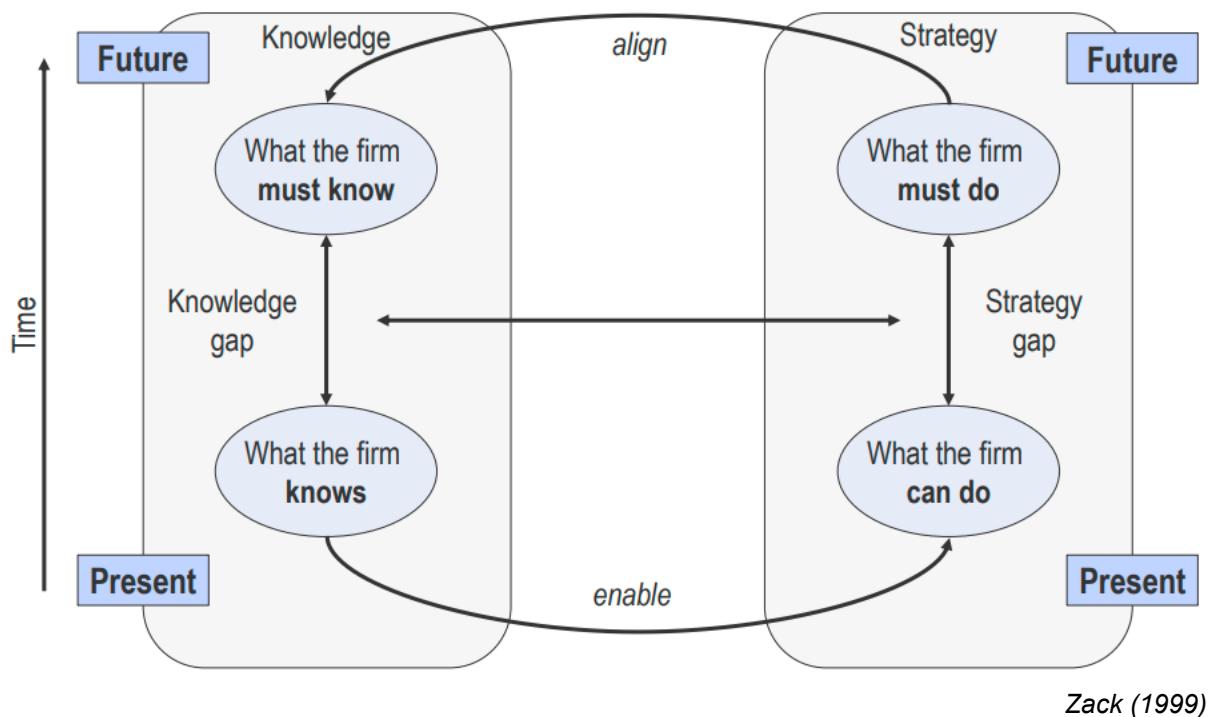
- mix of framed experience, values, contextual information, and expert insight
- provides framework for evaluating and incorporating new experiences and information
- originates and is applied in the mind of knowers
- understanding of rules needed to interpret information
- appropriate collection of information, such that its intent is to be useful
- characteristics:
 - using knowledge does NOT consume it
 - transferring knowledge does NOT result in losing it
 - knowledge is abundant, but ability to use it is scarce
- embedded in documents, repositories, routines, processes and norms

Understand how Knowledge Management relate to strategy

Objectives

- Knowledge Management
 - identify, capture, evaluate, retrieve and share all of an enterprise's information asset
- Knowledge Sharing
 - individual provides knowledge to others
 - social process, not only a question of management

KM & Strategy



What to manage in KM

- 70% **People:** attitudes, sharing, innovation, team work, motivation, organization, communities
- 20% **Process:** KM maps, workflows, integration, best practices, business intelligence, standards
- 10% **Technology:** data stores, networks, internet, data mining & analysis, decision tools, automation

→ Learning

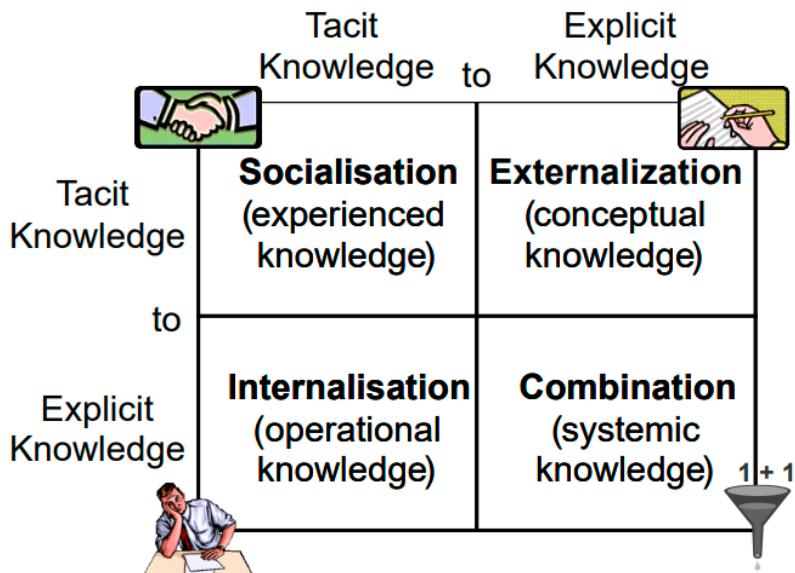
Business Process as area of Application

- Input: knowledge domain as resource
- output: knowledge as product / service

Strategies for KM: **Communication** (between groups) & **Codification**

Explain different types of knowledge, how they can be converted, and how this scales in organizations

Knowledge Conversion

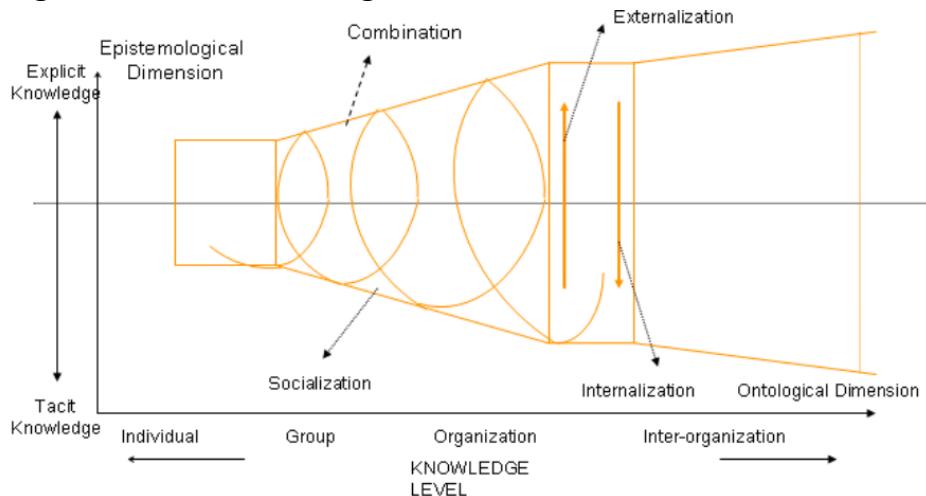


Rehäuser & Krcmar (1996)

- Codification: Zugriff für andere Gruppen (Internalisation, Combination & Externalization)

Tacit knowledge (~ 90%: Eisberg unter Wasser)	Explicit knowledge (~ 10%: Spitze vom Eisberg)
<ul style="list-style-type: none"> - knowledge extremely difficult to make explicit (implied) - subjective, cognitive - highly personalized - difficult to formalize - sticky knowledge 	<ul style="list-style-type: none"> - set out in tangible form (physical) - e.g. policies, goals, strategies, papers, reports - codified/leaky knowledge

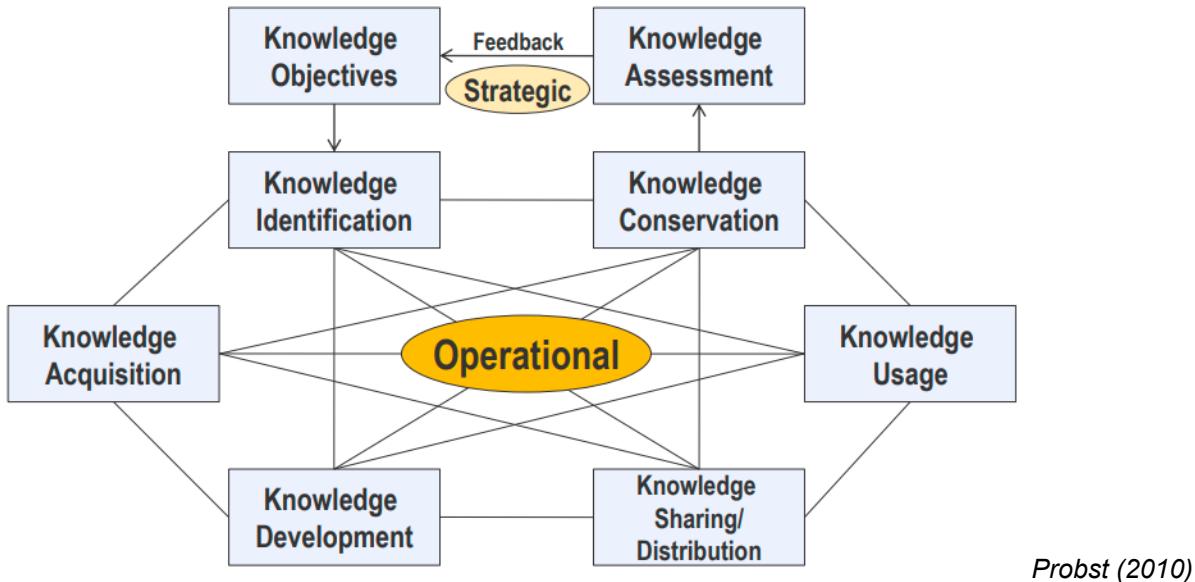
Organizational Knowledge Creation



Nonaka (1994)

- multiply knowledge by transferring to others through externalization & internalization (also increases through combination & socialization), more knowledge with more people
- info might get lost

Core Process of KM and examples for each step



Knowledge Objectives

- what kind of knowledge **important today as well as in the future** with a **knowledge-based competitive advantage**
- where in the organization is what kind of knowledge needed
- **strategic planning** of organizational knowledge base
- Goals:
 - **normative**: knowledge oriented corporate culture
 - **strategic**: retain / establish knowledge (organizational structure, management system)
 - **operative**: execution of strategic knowledge goals, define operational goals for day-to-day business

Knowledge Identification

- how to **create transparency about existing knowledge**
- task: analysis and description of knowledge environment
- challenge: **overview** of internal and external data, information, and capabilities
- problems: **inefficiency**, uninformed decisions, duplication
- approaches
 - **knowledge bearer maps** (research methods, publications, technical, teaching)
 - knowledge balance sheets
 - process modelling

Knowledge Acquisition

- what **capabilities to acquire from external sources**
- task: what knowledge to acquire through recruiting or acquisition (consultants)
- challenge: ensure **best possible access to external knowledge**
- problems: **unused potential** for KA in existing corporations
- approaches
 - hiring
 - **consulting**
 - outsourcing, mergers, acquisitions

Knowledge Development

- build up **new knowledge**
- task: build new knowledge additional to external acquisition
- challenge: develop **new capabilities**, better **ideas**, powerful **processes**
- problems: knowledge creation very **difficult** in areas without expertise (R&D)
- approaches
 - learning environment (create freedom, reduce workload, ...)
 - room for experiments
 - workshops
- example: **MOOC** (online courses); data warehouse, process mining

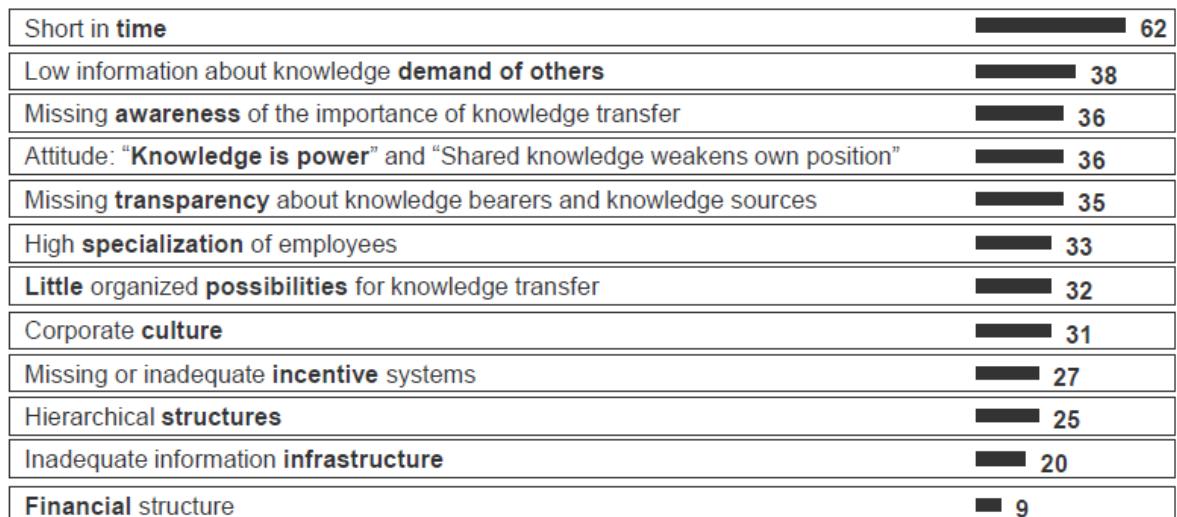
Lecture 12: Basics and Tools of KM

Core Process of KM and examples for each step

Knowledge Sharing and Distribution

- get knowledge to the right places
- task: make knowledge accessible for people who need it
- challenge: **transfer** knowledge (individuals → groups)
- problems: **no access** (codification) to existing knowledge
- approaches
 - room for exchange
 - **WIKIs** (edit any page, simple mark-up language, used collaboratively)
 - Enterprise Social Networks (communication, collaboration, networking)
e.g. **slack**
 - overcome obstacles (digital objects difficult to find & access, identify people who can help, make invisible communication visible)
 - (Reverse-) Mentoring
- barriers:

Percentage of respondents who are hampered by this knowledge transfer barriers:



Missing time is seen as number one enemy of effective knowledge transfer

Knowledge usage

- make sure knowledge is actually used
- task: ensure productive use of organizational knowledge
- challenge: knowledge identification is not enough
- problems: barriers **inhibit use of external knowledge**

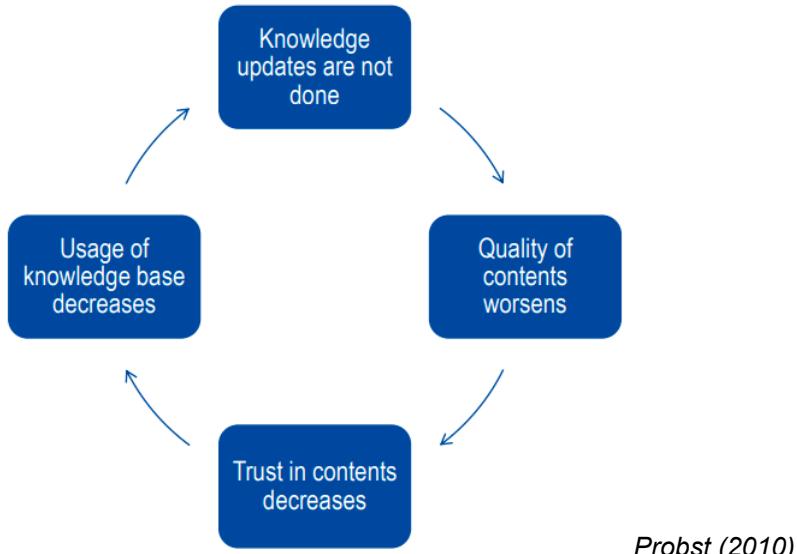
examples:

- knowledge communities
 - informal group of people with shared interest to specific subject
 - communities support (app): membership, work-flows, tools (chat, repository), analyze member data and profiles
- lessons learned
 - systematic documentation and processing of experiences to learn from them
 - pro: preserves knowledge, avoids extra or duplicate work, reduces training time of new employees
 - contra: documenting effort, requires willingness of employees to share and use knowledge, plan in time (management)
 - exp: Xerox
- best practice sharing
 - document best possible solution (efficiency, effectiveness) to a given problem
 - replace existing processes
 - pro: increase efficiency and effectiveness, solutions are proven in practice

- contra: lack of generalizability (too specific to an organization), too strong focus may be limiting
- storytelling
 - create and distribute stories (learning histories)
 - common: how will organizations deal with obstacles?; How will boss react to mistakes?
 - pro: sets knowledge into a context, well-suited for complex issues, perfect for human beings, more flexible than lessons learned or best practices
 - contra: highly time-consuming, high personnel effort to create stories, no short-term benefits

Knowledge Conservation

- guard myself against knowledge losses
- task: select important knowledge, ensure adequate storage, regular updates
- challenge: existing knowledge should be useable in the future
- problems: knowledge loss through re-organization or movement of labor



examples:

- knowledge repositories = depositories for explicit knowledge in which knowledge units (KU) are registered, administered and made accessible
- ontology: concepts set into relation (vehicle-water-air)

Knowledge Assessment

- do KM investments pay off
- measure effort in KM: select suitable indicators
- reveal success and failure in KM
- without measure KM would NOT be efficient → cycle incomplete

examples:

- balanced scorecard
- benchmarking: systematic comparison products, services or processes to identify strengths and weaknesses (internal, competitive, functional, generic)

Concept of organizational metaknowledge and how it supports KM

“Organizational metaknowledge refers to knowledge about who knows what and who knows whom within the organization”

Visible communication improves meta-knowledge

- **message transparency**: seeing coworkers' messages helps to **infer about others' knowledge**
- **network translucence**: seeing structure of coworkers' communication networks helps to **infer about who coworkers talk with** somewhat regularly