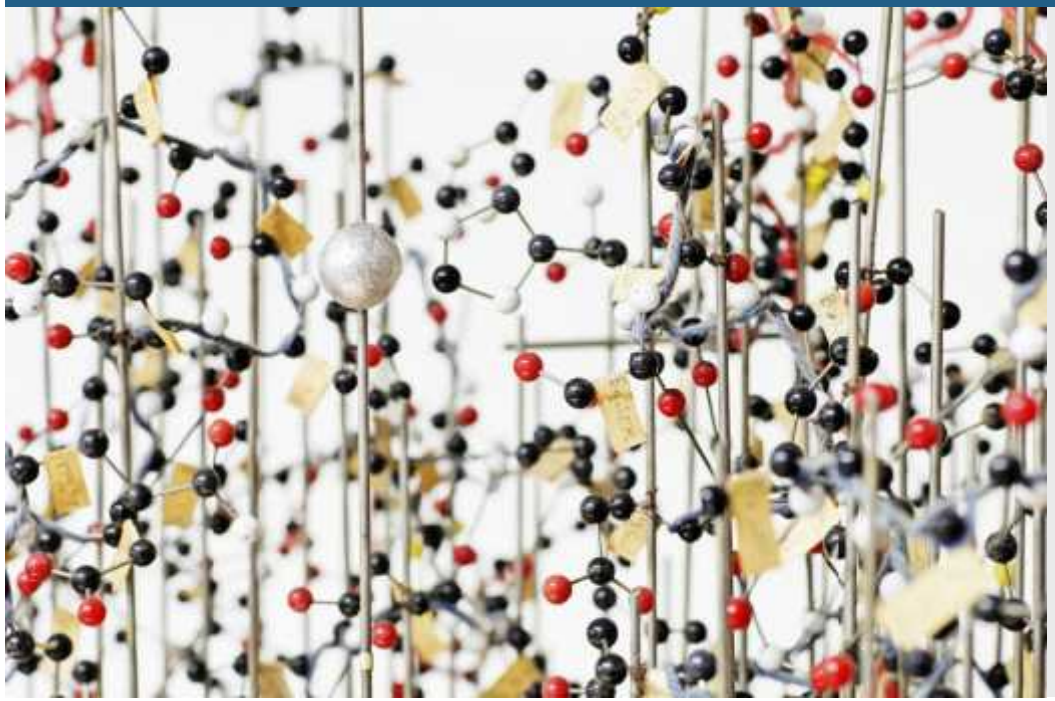
Succesful Implementation of Telemedicine Solutions



Jesper Thestrup

IN-JET APS

Sustainable business models in telemonitoring services

Methods and tools; case studies

REACTION

Economics – from top to bottom

- Macro economic view: Health care costs, benefits and outlook
  - Healthcare costs explosions
  - Value/costs viewpoints
  - Need for innovation
- Societal view: Health outcome vs. organisational costs
  - Metrics of health impact
  - Measuring organisational cost-benefit
  - Valorisation of solution impact
- Market view: Public-private cooperation on telemedicine
  - Business models fundamentals
  - Various forms of business models
  - Value models – methodology and tools
- Sustainable business cases
  - Case1: REACTION application for in-hospital use
  - Case2: REACTION application for primary care use

REACTION

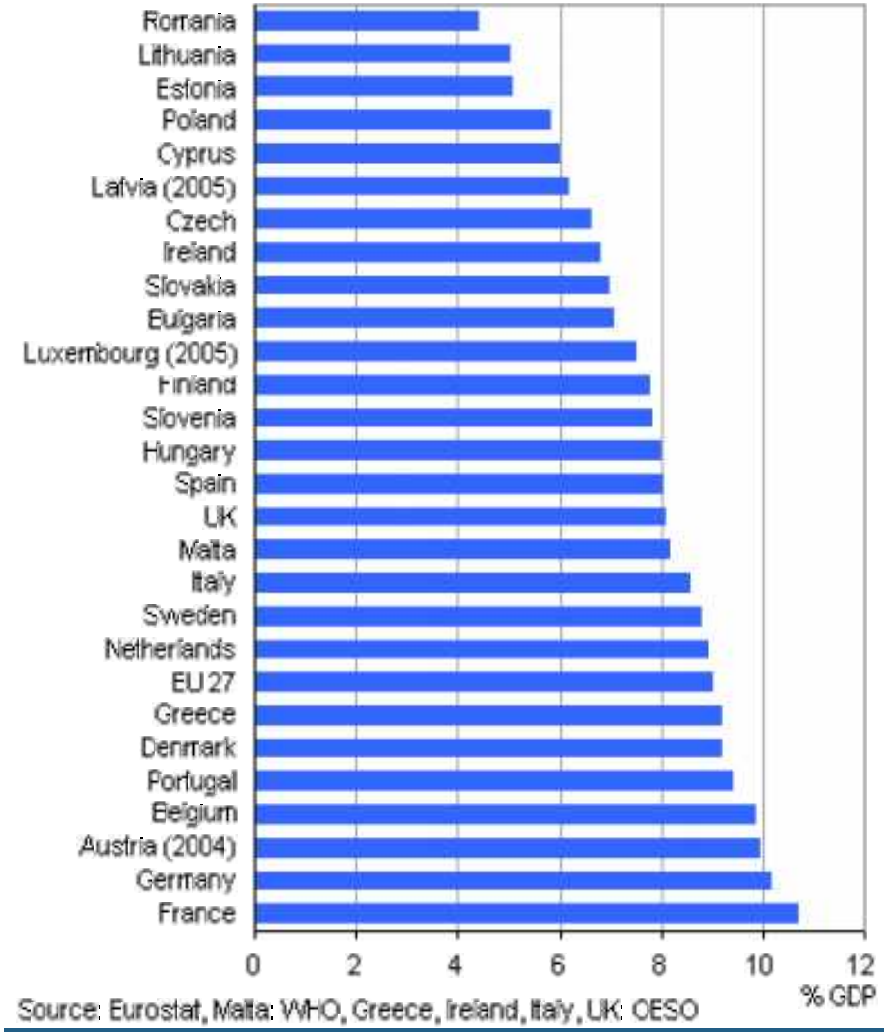
Healthcare Macro Economics

Demographic development makes the present healthcare system unsustainable

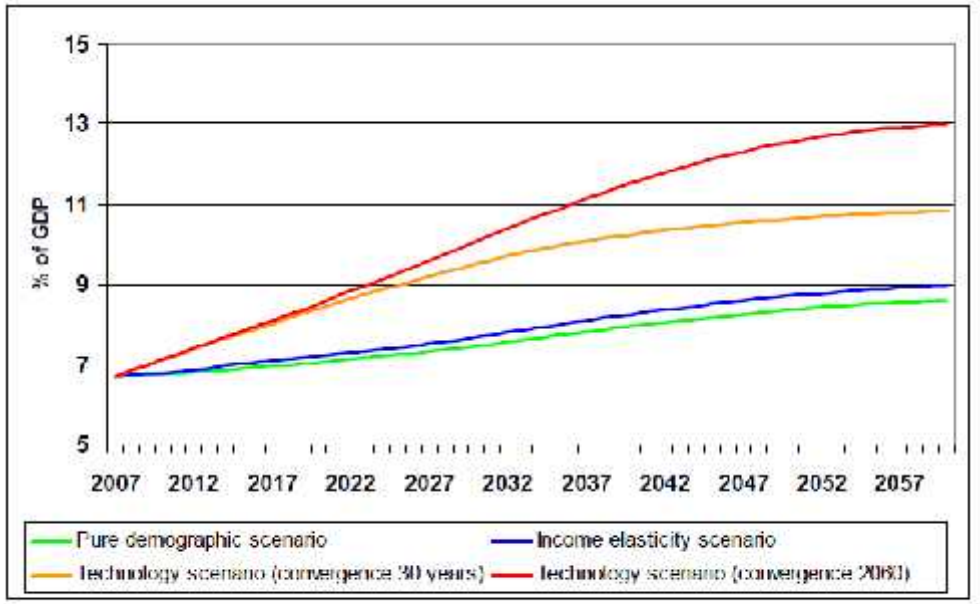
Recessions and sluggish general economic growth requires new impetus to cost effective health management

Health care costs in Europe

Costs of health care relative to GDP in the EU, 2006



Comparison of EU-27 health care expenditure projections

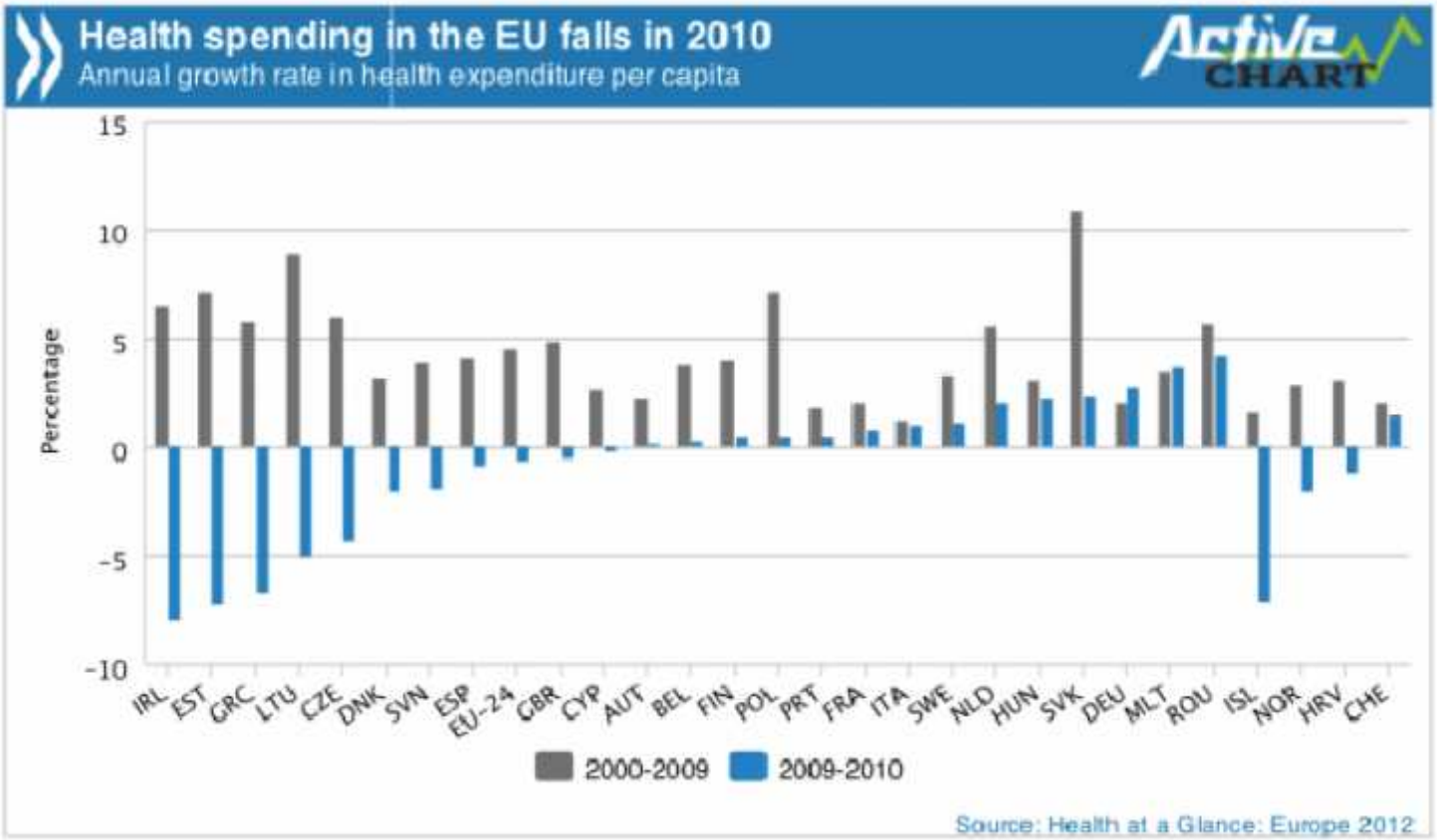


Source: based on European Commission and Economic Policy Committee (2009)

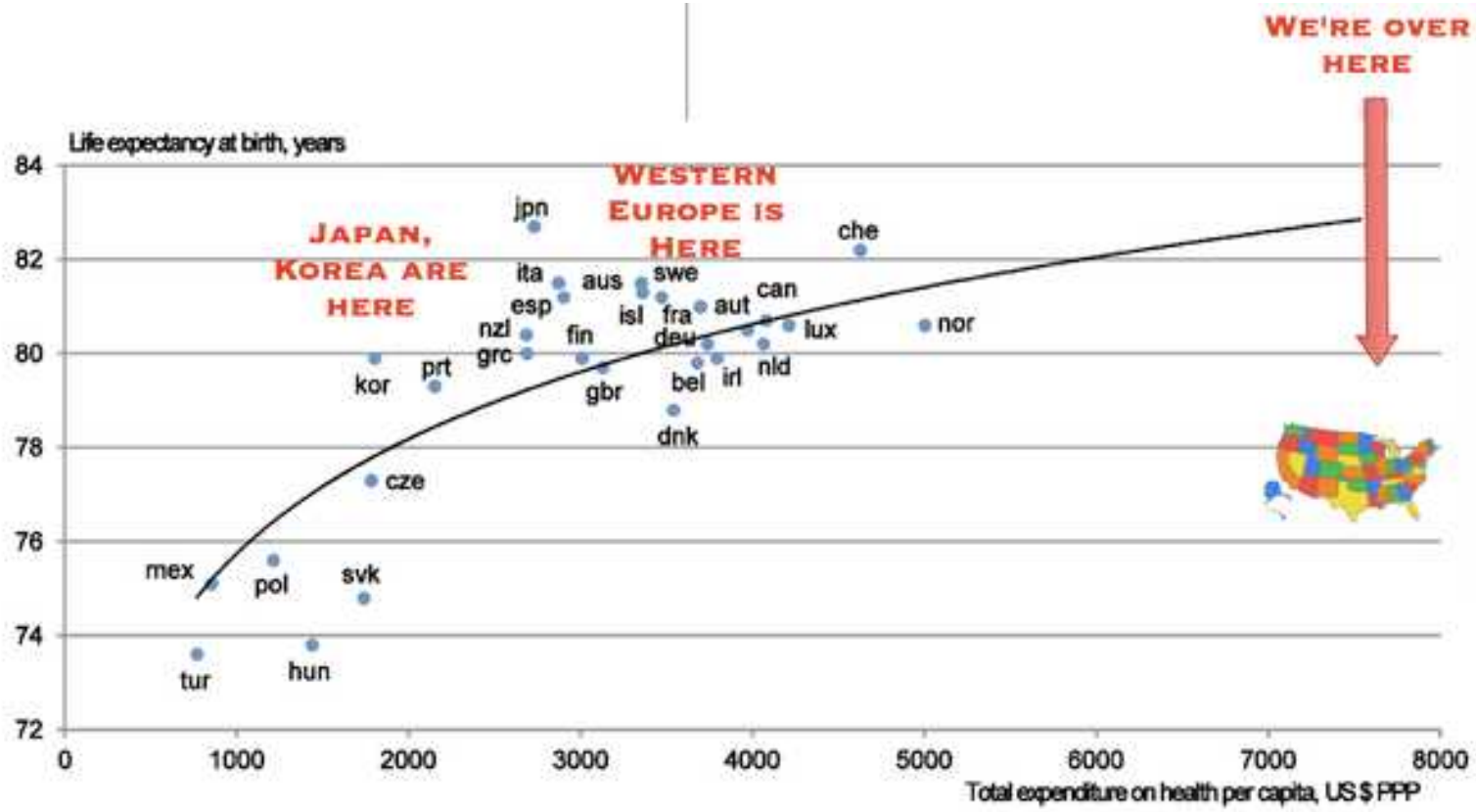
European healthcare costs are falling

The financial crisis has taken its toll in Europe

Greece cut 40% of healthcare costs (€8b). Going to ePrescriptions saved €2b alone!



Life expectancy at birth



What is the value of healthcare?

- The US spends $2.5 trillion ($2.5x10^{12}$ or $2,500,000,000,000) on healthcare corresponding to 17% of GDP!
- Is the US healthcare system worth its cost?
- From a medical point of view the answer may be: NO!
  - US population is younger, have fewer visits to doctor and hospital and use less on intervention, BUT:
  - US population, lives much shorter than EU, dies more frequently in hospitals and have many more lifestyle diseases
- From a macro economic point of view the answer may be: YES!
  - The increase in longevity since 1950 has been as valuable as all other economical growth combined.
  - Medical advances producing 10% reduction in mortality from cancer and heart disease would add some $10 trillion to GDP, i.e. +68%!

Source: epianalysis 2012, Uwe Reinhardt, 2013

A message from an economist

Prof. Uwe E. Reinhardt

James Madison Professor of Political Economy, Professor of Economics and Public Affairs

Princeton, NJ, USA

Recognized as one of the nation's leading authorities on healthcare economics, Reinhardt has been a member of the Institute of Medicine of the National Academy of Sciences since 1978. He is a past president of the Association of Health Services Research. From 1986 to 1995 he served as a commissioner on the Physician Payment Review Committee, established in 1986 by Congress to advise it on issues related to the payment of physicians. He is a senior associate of the Judge Institute for Management of Cambridge University, UK, and a trustee of Duke University, and the Duke University Health System. Reinhardt is or was a member of numerous editorial boards, among them the Journal of Health Economics, the Milbank Memorial Quarterly, Health Affairs, the New England Journal of Medicine, and the Journal of the American Medical Association. Ph.D. Yale University.

Keynote speaker at the European Health Forum Gastein

"Bailing out Healthcare through Innovation"

2-4 October 2013,
Bad Hofgastein, Austria

The healthcare value creation mantra

- There have always been two distinct views on healthcare:

  I. VIEW: As long as an innovative medical procedure (or any other) yields positive benefits to patients at all, it should be done.

  II. VIEW: Even if the benefits from a medical procedure are positive, the intervention should be done only if the value of those benefits covers their opportunity costs.

- For many decades after WW II, VIEW I drove health policy in many developed countries, certainly in the U.S.
- In no other sector of the economy do we look only at the value created by an activity, but not its opportunity cost
- Doctors, hospitals, pharma, etc. persuaded us to that they claimed was EINSTEIN'S VALUE THEORY OF HEALTHCARE

$$V_i = \ln\{\lim_{\delta \to \infty}(1+1/\delta)^{\delta}\} \cdot C_i^{\ln(1)} \cdot M_i \left[\int_{-\infty}^{\infty} \frac{1}{(2\pi)^{1/2}\sigma} e^{-1/2([v_i - \mu]/\sigma)^2} dv_i\right]$$

where

V_i = the value of health care produced in in country i

M_i = health spending per capita in country i

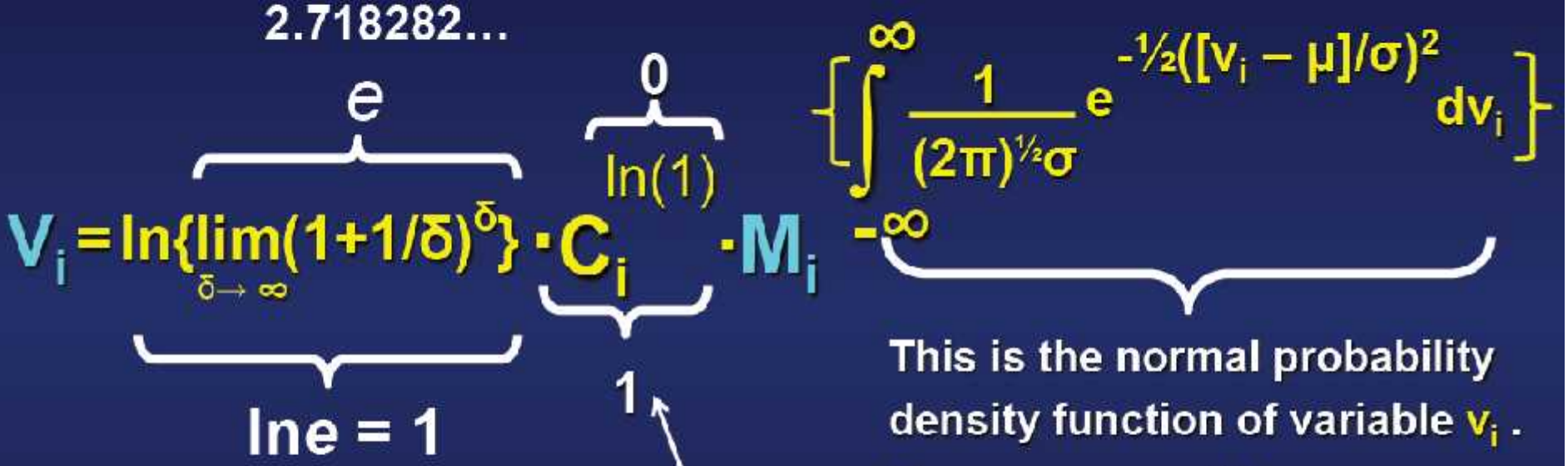
C_i = a country-specific real number that translates money (M_i) into quality (V_i)

v_i = the deviation of average physician visits per capita in country i from the world average -- a random variable distributed with mean μ and standard deviation σ

δ = a real number that varies over time

Source: Uwe Reinhardt, 2013

This complicated equation can be simplified a bit, as follows:



Raising a real number to the power 1 is doing nothing to the number, and if you don't do nothing to a number it stays the same – as it were.

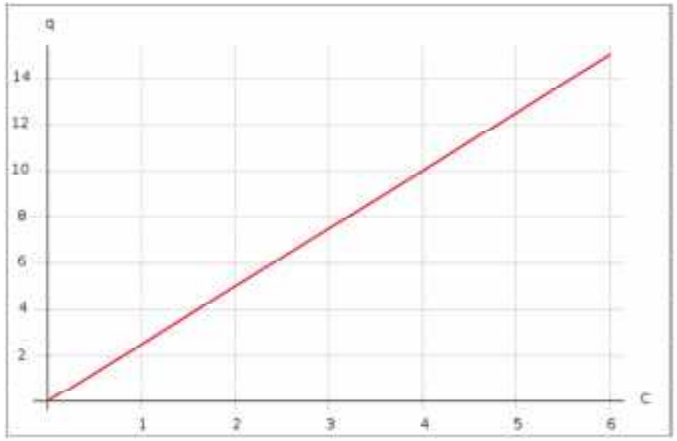
Source: Uwe Reinhardt, 2013

The sky is the limit….

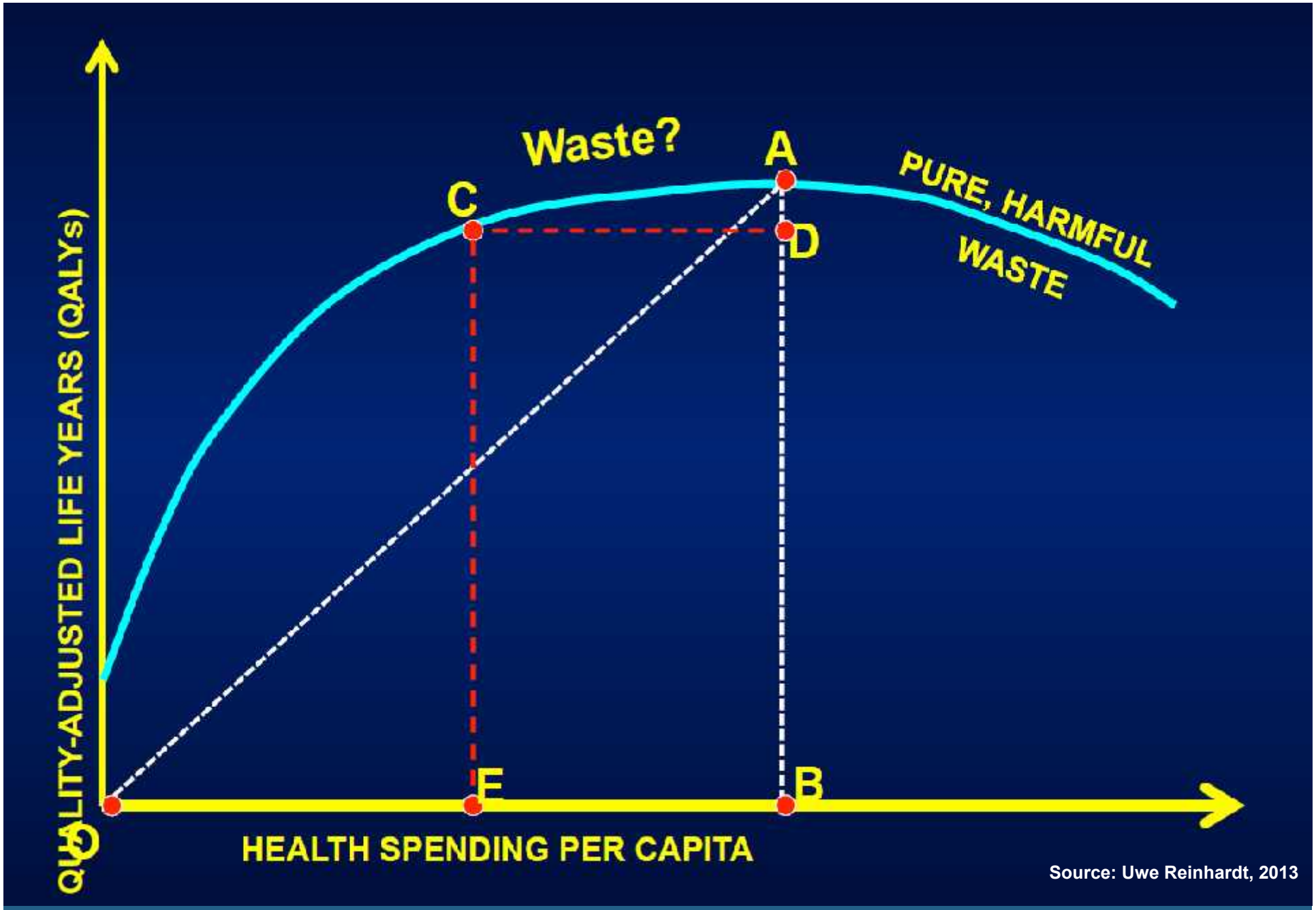
So in practice Einstein's theory of modern medicine reduces to

V = M

i.e., the value of healthcare is always equal to the money put into it.



Source: Uwe Reinhardt, 2013


Waste?
A
C
D
PURE, HARMFUL
WASTE
QUALITY-ADJUSTED LIFE YEARS (QALYs)
O
F
B
HEALTH SPENDING PER CAPITA
Source: Uwe Reinhardt, 2013

Innovations needed to bail out healthcare

Conclusion from Uwe Reinhardt:

- Simplifying administration
  - Administrative process, organisational mismatch, expensive care vs. prevention and early diagnostics
- More efficient “industrial” processes
  - Integrated delivery of care, clinical logistics, reimbursement reform
- Better health management by individuals
  - From healthcare to health production, personal health management, education for health, gamification
- Technological innovations in healthcare products are not just cost drivers
  - Biologics, genomics, nano technology, bio mathemathics, computers and ICT

Source: Uwe Reinhardt, 2013

Questions?

- Is View I (V=M) still prevalent in our healthcare systems in 2013?
- How big is the reduction in V from a 5% reduction in M (DK/SE)?
- Does a reduction in administration costs lead to lower V?
- Which scenario for the 2060 forecast is the most likely?
- Can self management and patient empowerment bail us out?
- Discussion

REACTION

Impact on Societal Health vs. Organisational Costs

The impact of technology shall be determined by its impact on health outcome – but how do we then choose?

The impact of technology shall be determined by its cost effectiveness – but how do we then choose?

Metrics of health impact

- Quality-Adjusted Life Years (QALYs)
  - QALY is a standardized measure of health impact in which a year in perfect health is given a value of one and a year in poorer health is given a value between zero and one. QALYs account for the fact that a year in good health is worth more to people than a year in poor health.
- Disability-Adjusted Life Years (DALYs)
  - DALYs are conceptually similar to QALYs but differ in some significant ways. Most importantly, DALY weights were determined by a group of public health experts, rather than through population-level assessments.
- Other Approaches
  - Healthy Year Equivalents
  - Saved-Young-Life Equivalents

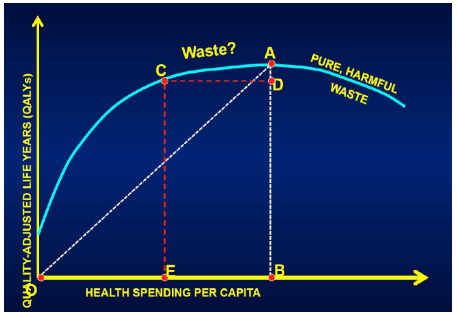
Measuring health impact – caveats

- Impact is based on trials with varying degrees of complexity
  - Clinical trial data do not describe effectiveness in the population
  - Clinical trial data on averages may not reflect the value of diversity
  - Location-dependent QALYs
  - Inadequate data
- The clinical trials are designed to test specific aspects of the technology
  - Differing interpretations of incomplete data
  - Comparative clinical data fail to demonstrate differences
- The trials are costly and lengthy
  - Single centre RCT, multicentre RCT, retrospective comparison, intervention

- BUT: we need trials to provide evidence!!
  - MAST : Uniform Health Technology Assesment method can be the answer

Measuring organisational cost/benefit

- Focus on organisational efficiency
  - LEON (DK) Lowest Effective Cost Level
    - Maintain quality of care
    - Maintain efficacy of care
    - Increase effectiveness
    - Increase efficiency



- Focus on prevention
  - In EU only 3% of healthcare costs is spent on prevention (JAMA, 2013)
  - Reduction in unplanned admissions
  - Improved rehabilitation
  - Promotion of self-care

- BUT: we assume that there is evidence for same or better health outcome!!

Potential sources of cost reduction

- Improvement in hospitalisation costs from better health status
  - Reduced length of stay (bed days)
  - Reduced planned re-admissions, reduced acute admissions
  - Improved rehabilitation potential
- More cost effective operations, integrated care
  - Avoiding duplication of work, better use of resources, streamlining processes and using information more efficiently
  - Higher throughput with the same resources
- Early detection of exacerbations, impairment of health
  - Improves triage and facilitates targeted, expedited interventions
  - Efficient and individualised interventions to exact condition
- Increased quality of life of patients
  - Less anxiety, peace of mind, less need for consultations, less need for involvement
- Patient empowerment, education, and motivation
  - Sharing of care between more actors
  - Behavioural reinforcement

Evidence of improvements in medical outcome from literature review

27 meta and RCT studies analysed

- CHF (17) e.g. from Inglis et al. 2011 (meta analysis n=9805):
  - CHF-related hospitalisations RR 0.79 (95% CI 0.67 to 0.94, P = 0.008)
  - all-cause mortality RR 0.66 (95% CI 0.54 to 0.81, P < 0.0001)

- COPD (5) e.g. from Koff et.al. (2009) RTC monocentric n=38 1/1)
  - Quality of life (SGRQ): intervention: 10.3 points improved (19%), control: 0.6 points improved (1%), p=0.018
  - Detection of exacerbations (9 vs. 2 patients)

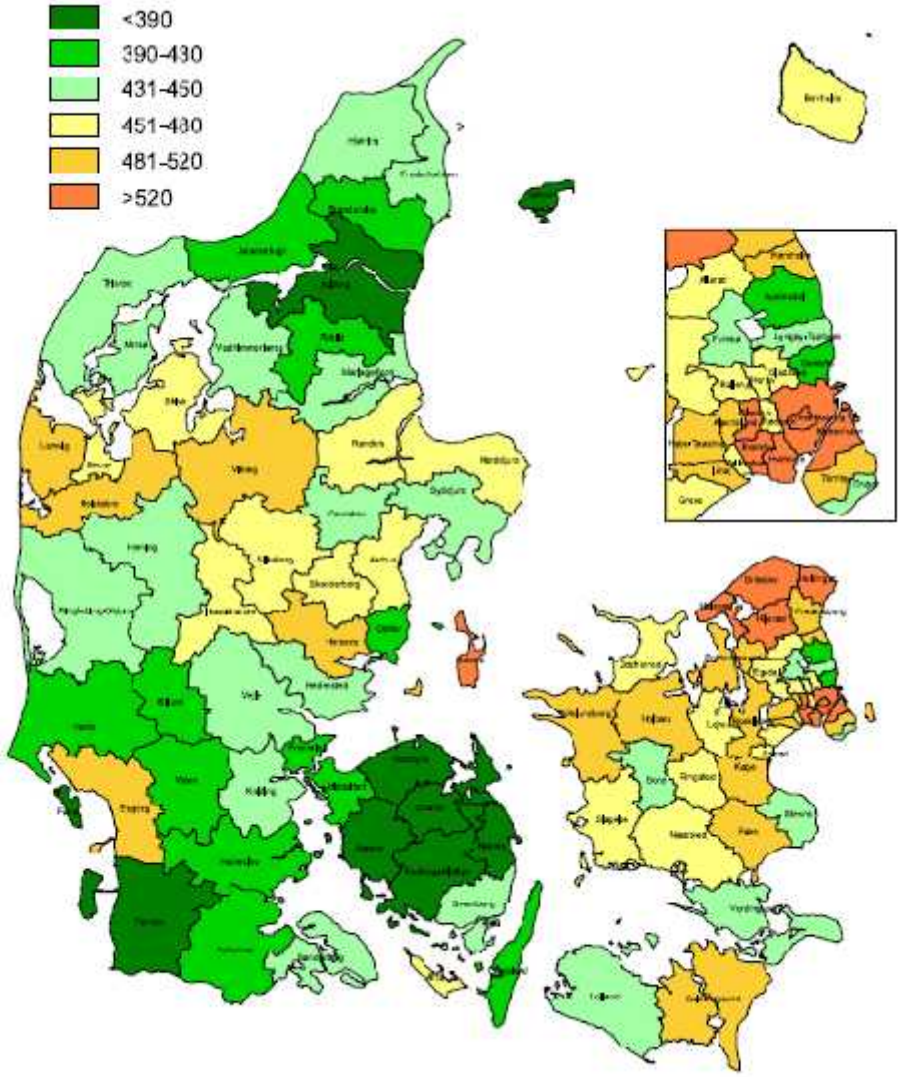
- Diabetes (2) e.g. Chumbler et al. 2009 (retro. comp. n=774 1/1) :
  - Mean survival time: intervention 1348 days versus 1278 days, p=0.015
  - 4-year all-cause mortality: RR 0.69 (95% CI 0.50–0.92, p=0.013)

- Multimorbidity (3) e.g. Darkins et al. 2008 (NC post eval. N=17025)
  - 25% reduction in number of bed days of care
  - 19% reduction in number of hospital admissions

Source: Telemedicine toolkit, COCIR, 2011

Hospital admissions in Denmark

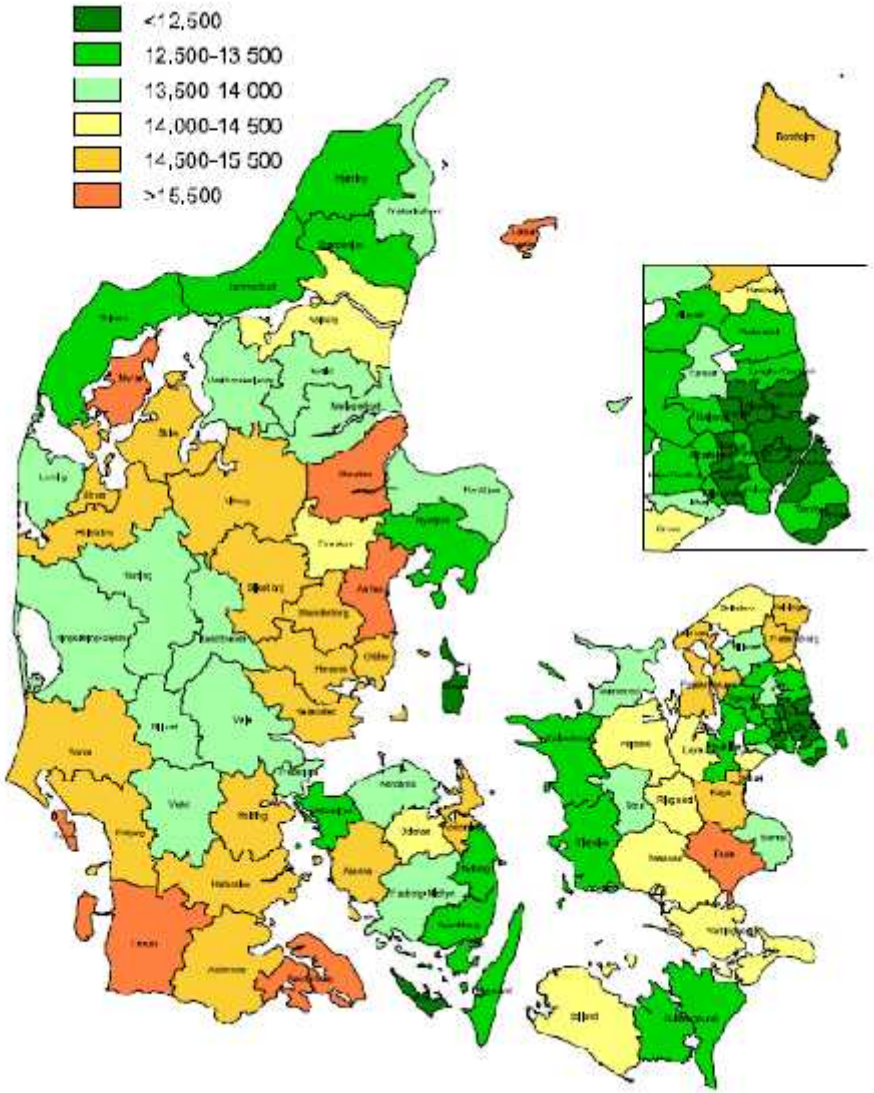
- Hospital admissions per 1000 patients with chronic conditions (2010?)
- Large regional deviations
  - Access to facilities
  - Difference in disease management
- Enticement structure as barrier for cost effectiveness
  - Treatment outside hospitals
  - New activity based payments for municipalities



Source: McKinsey, 2010

Visits to general practice in Denmark

- Visits to general practice per 1000 patients with chronic conditions (2010?)
- Large regional deviations
  - Access to facilities
  - Difference in disease management
- Enticement structure as barrier for cost effectiveness
  - Treatment outside hospitals
  - New activity based payments for municipalities



Source: McKinsey, 2010

Valorisation of what bails out healthcare

Conclusions and identification for value propositions

- Establishing evidence and securing the impact on healthcare
  - Health impact must be evidenced not to be inferior to previous procedures
- Identifying the potential cost savings
  - Reduce expensive care through prevention and early diagnostics
  - Integrated delivery of care, clinical logistics, work flow, shared care
  - Simplifying administration
- Better health management by individuals
  - Personal health management, education for health, joint care
  - Motivation for lifestyle changes, gamification
  - Peace of mind, increased quality of life

Questions?

- Today, on a scale from 1 to 10, where is telemedicine positioned by the medical profession in your view? Examples?
- How shall we handle the inconclusive evidence for health outcome from telemedicine?
- What is the most promising source of cost savings? Hospitalisation or …?
- When do we get Personal Health Systems in DK like in SE?
- Discussion

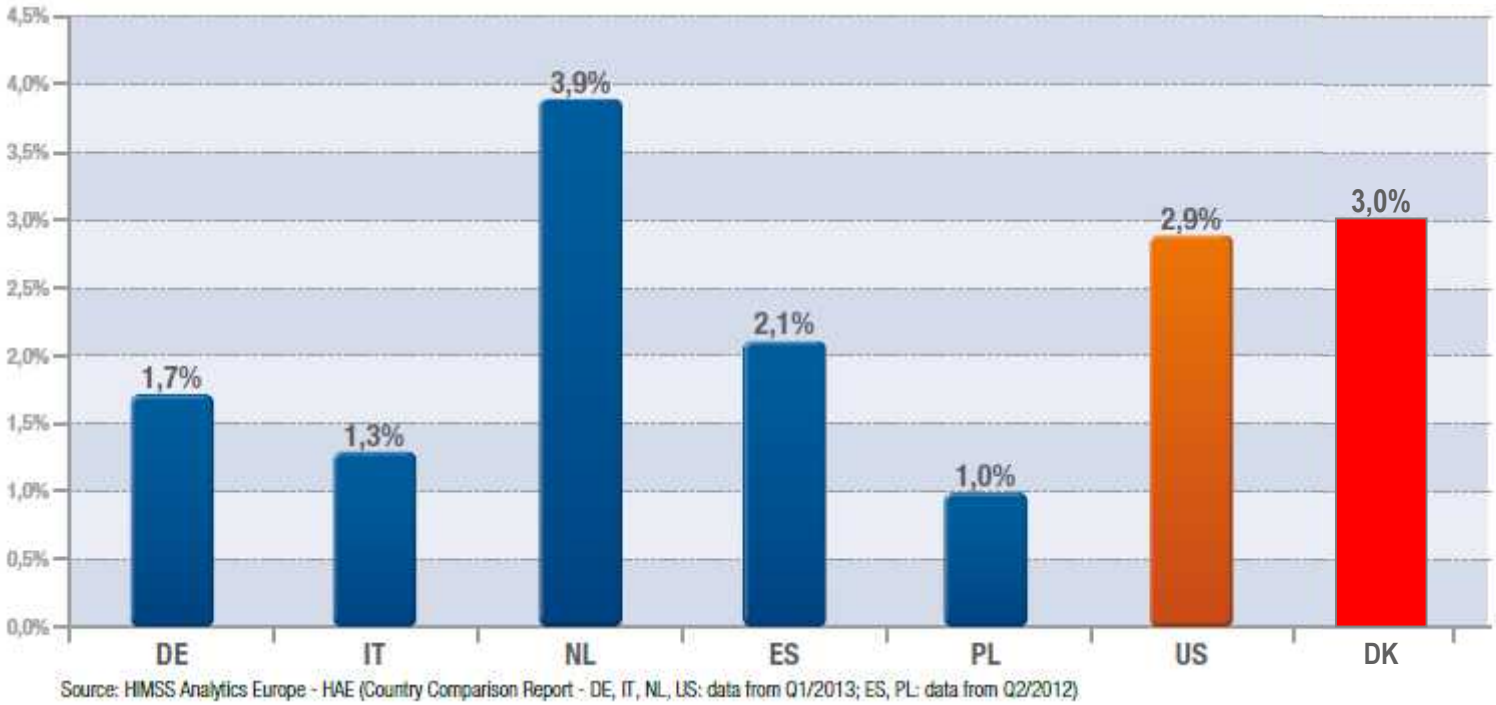
REACTION

Private – Public Cooperation

Developing solutions that save costs for public healthcare providers. Why is it so difficult?

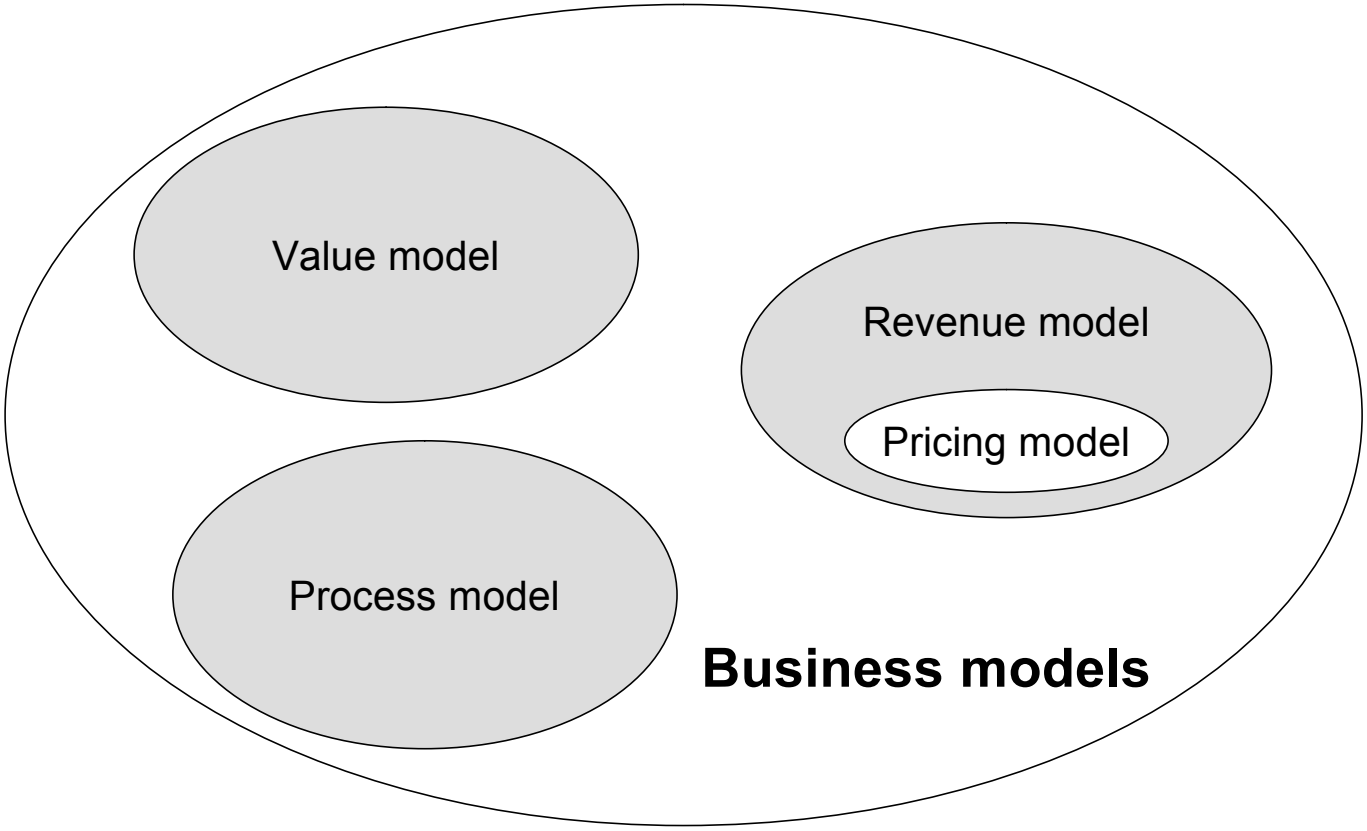
Economic income for commercial vendors is the prerequisite for sustainability of the business. Why is it so difficult?

Annual ICT Investments in % of total hospital operating expenses



Source: Telemedicine Toolkit, COCIR 2013 – ICT deployment in the regions, McKinsey 2010

Business model approaches



Process models

- Process modelling refers to procedures of the same nature that are classified together into a model
  - a process model is a description of a process at the type level; a (real) process so becomes an instantiation of it
- One possible use of a process model is to prescribe how things must/should/could be done in contrast to the process itself which is really what happens
- What the process shall be will be determined during actual system development

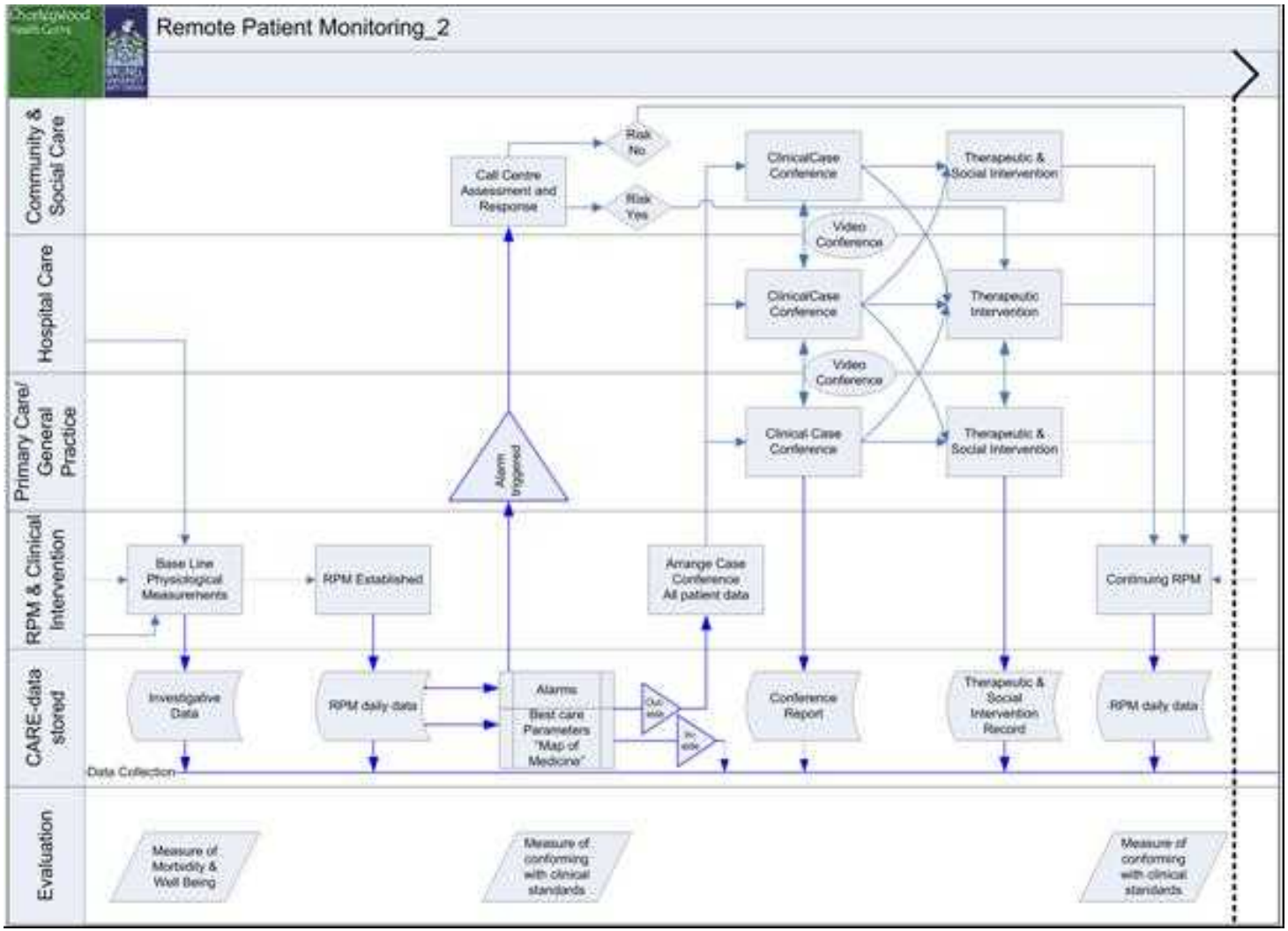
Business process modelling

- A representation of the entire (or a specific part) company's operation, usually in the form of a graphical depiction of the structure and activities of the operation itself
- BPM, also known as mapping, aims at identifying, documenting, analysing and developing a business process, so enabling a common understanding among different user levels.
- There are five key stages to process mapping:
  - study of current flow of processes – "As-Is" state
  - identification of sources of waste
  - consider whether the sequence of activities can be rearranged and made efficient – "To-be" (or ideal) process
  - optimisation of flow layout – e.g. reducing distances between stages
  - removal of unnecessary activities

Mapping approaches

flow diagramming tools	Programs for the visualisation and management of flow diagrams
case tools	Applications for the edition and comprehension of scenarios and use cases
simulation tools	Applications framework for the dynamical representation of large and complex systems

Example of primary care process for



Tools, techniques, methodologies

Focus of method/tool	Example
Strategic planning	Balanced Scorecard - BSC, Benchmarking
Accounting techniques	Activity Based Costing Analysis - ABC, Return on Investment - ROI
Continuous improvement	Total Quality Management - TQM, ISO Standard
Static process modelling or functional decomposition modelling	Data Flow Diagrams - DFD, IDEF - Integrated DEFinition (IDEF0)
Action coordination modelling	Action Workflow modelling method, IDEF3
Dynamic process modelling (simulation)	Petri Nets

Questions?

- Are you working with process models?
- Are they effective?
- What are the pros and cons in relation to correctly identifying sources of waste?
- How do they work with entirely new technologies/processes?
- Discussion

Value models

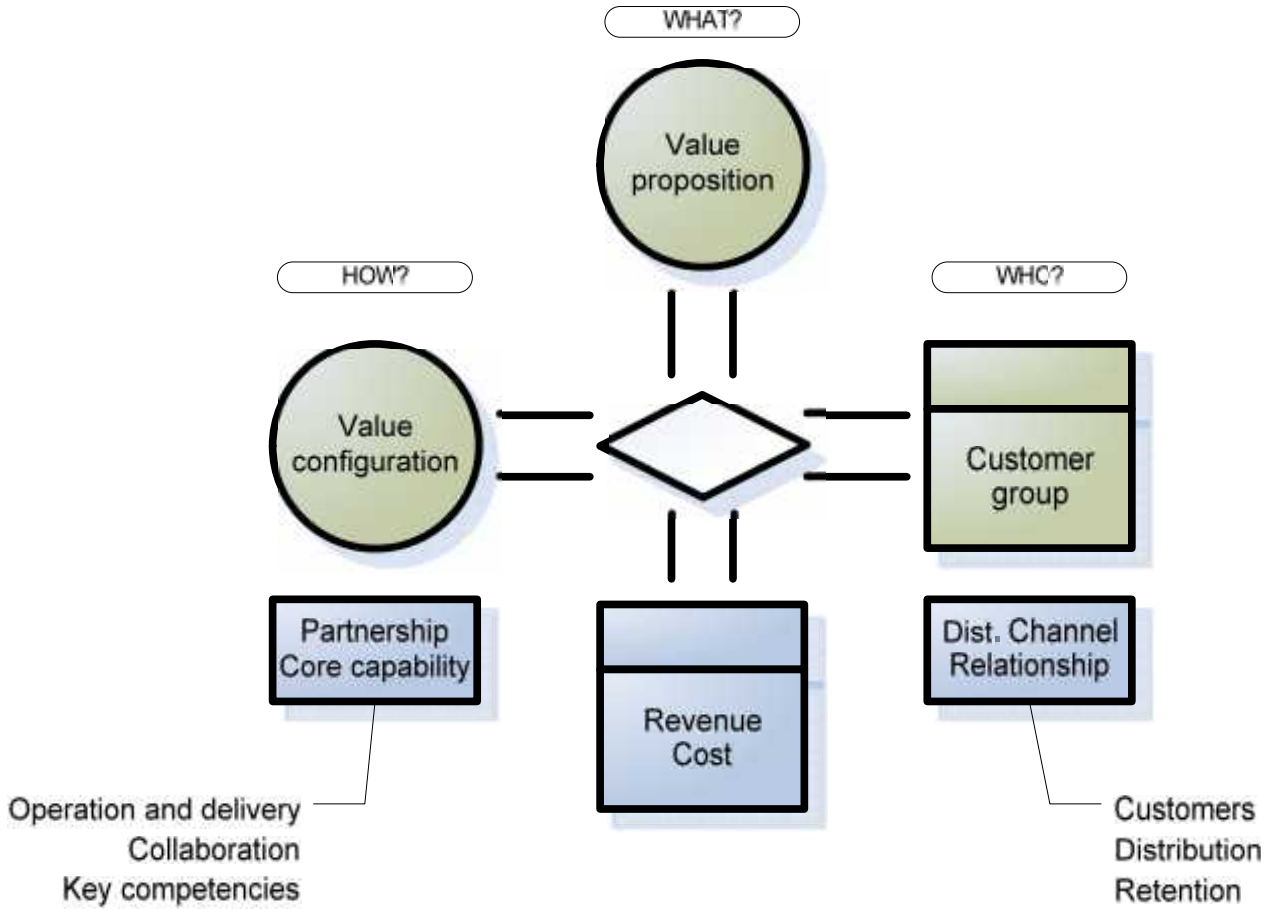
- A value offering is the result of a complex set of value creating activities involving different actors working together to produce it for and with the customer.
- The concept of “value constellation” replaces the value chain idea
- Hence, the goal of a business is not to make something singularly for healthcare providers, but to encourage them to take advantage of a multitude of offerings from different constellations of suppliers and hereby create value for themselves

Value proposition

A value proposition is a *promise of value* to be delivered…

… and a belief from the customer that *value will be experienced*.

This will hopefully result in a *value transaction*!

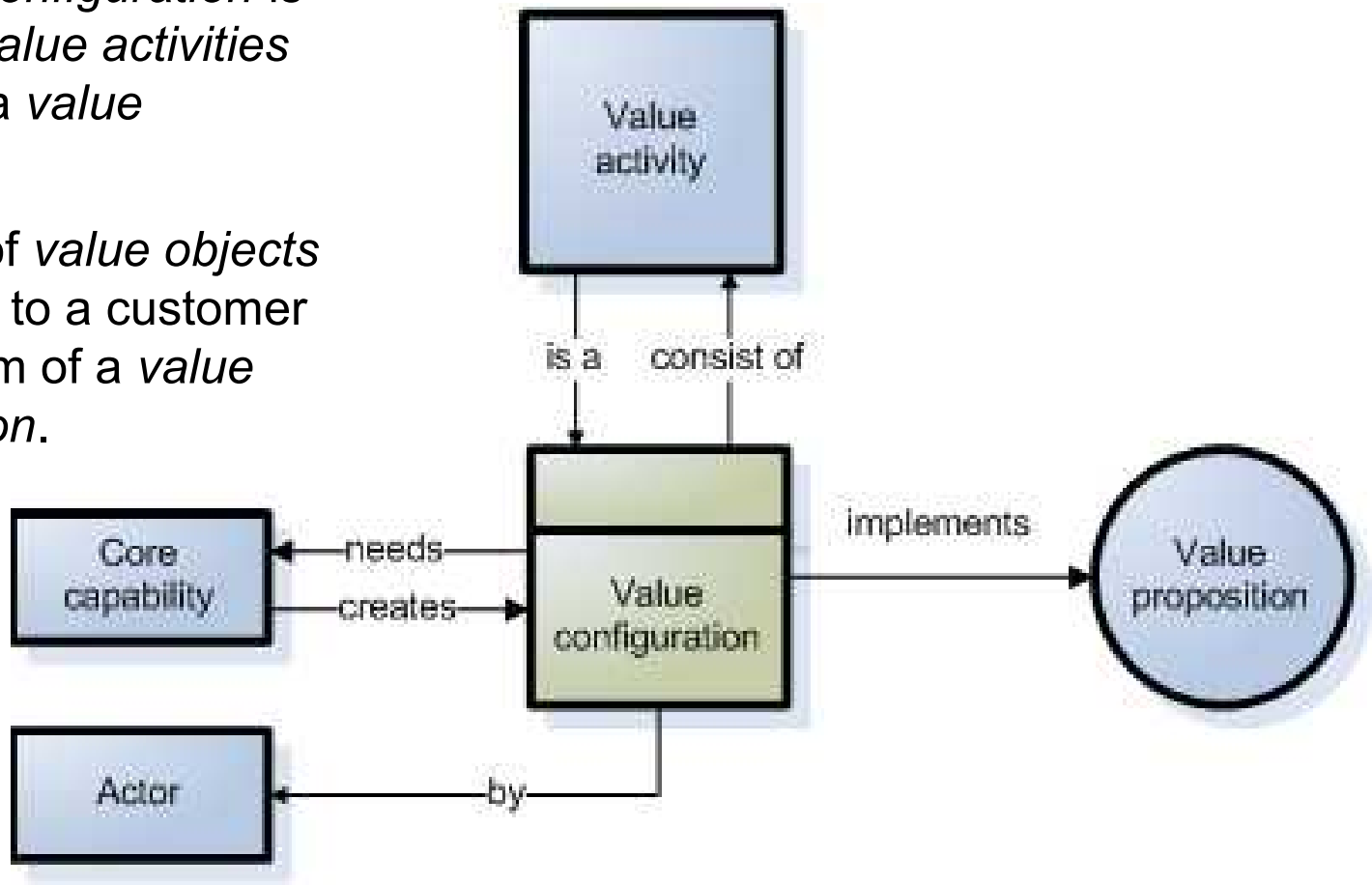


Source: Yves Pigneur, 2006

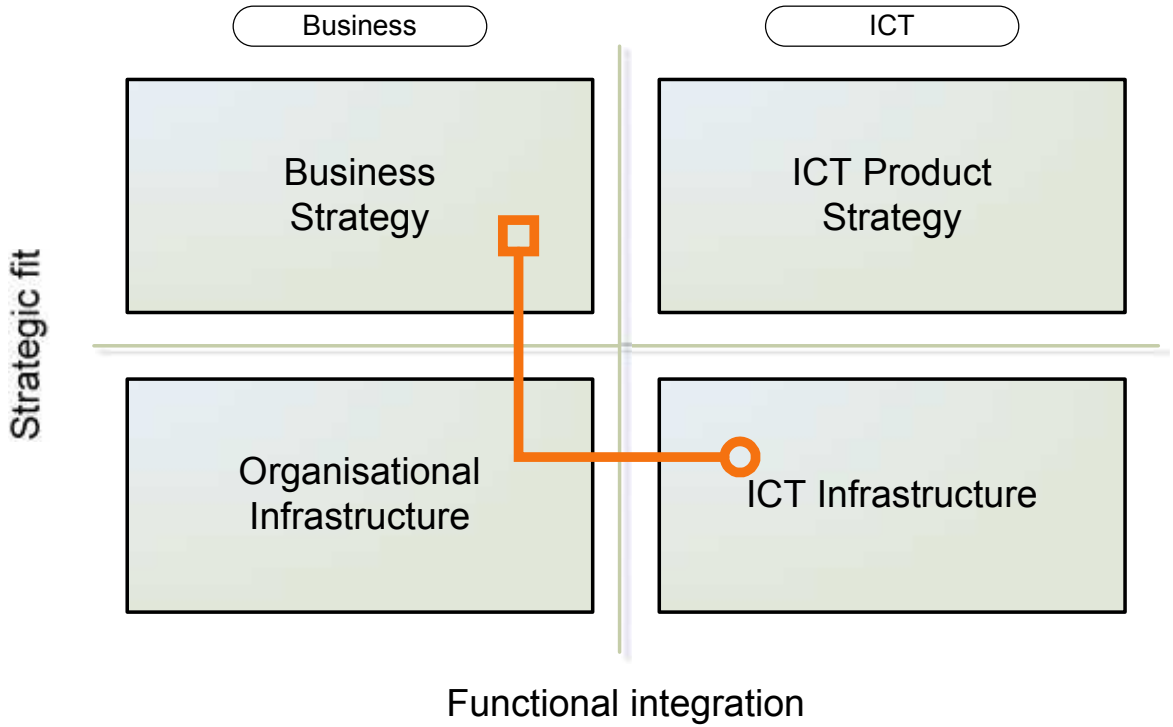
Value configuration

A *value configuration* is a set of *value activities* creating a *value object*…

… a set of *value objects* is offered to a customer in the form of a *value proposition*.

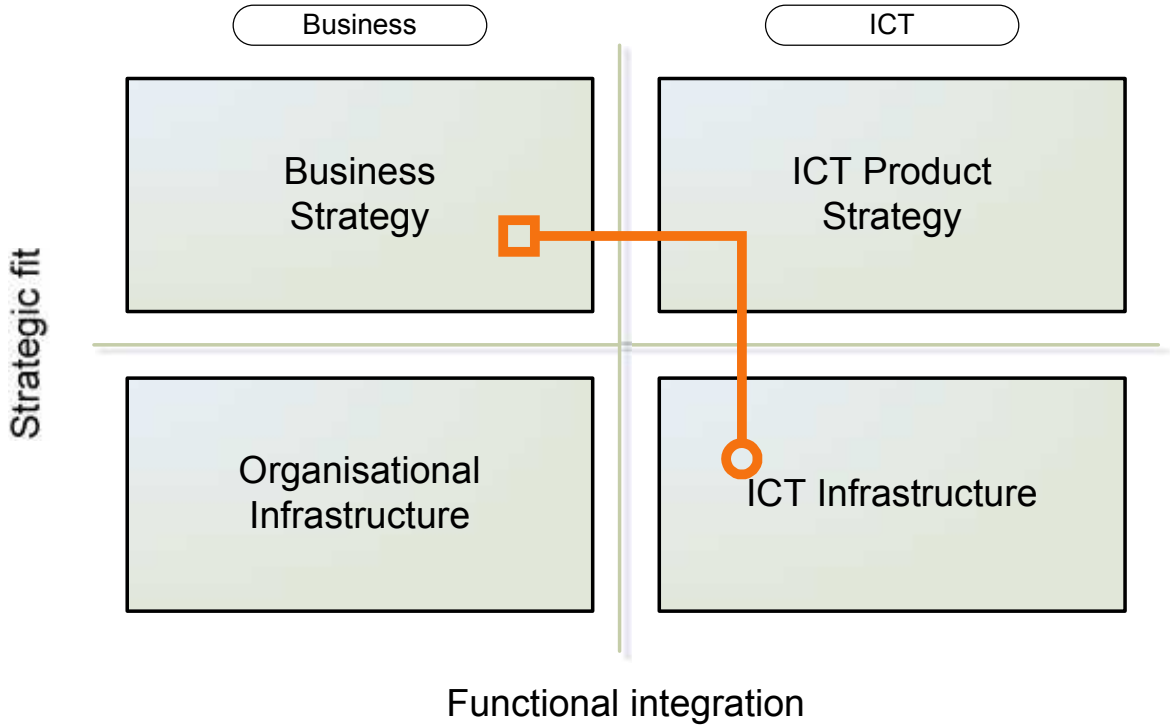


Modelling ontologies



Process models are designed to give optimum process implementation, but are not so effective in radically new approaches to the way the company is doing business

Modelling ontologies



Value modelling looks at where value is created and for whom. Value modelling is very suitable for engineering radical strategic changes including new product strategies and organisational infrastructures

Questions?

- Why is a value constallation better than a value chain?
- Can competitors work together in a value network?
- What is the value proposition from telemedicine?
- Discussion

REACTION

Sustainable business cases

Case1: REACTION application for in-hospital use

Case2: REACTION application for primary care use

Purpose of value modelling tools

- Is the offering feasible in terms of value proposition to the customer?
- Is the offering overall profitable?
- Is the global profit fairly distributed on all the involved actors?
- Is the intended offering feasible in terms of usability?
- Is the offering easily understood and acceptable to all stakeholders?

In order to provide the answers to these questions, a conceptual modelling tool should be at hand

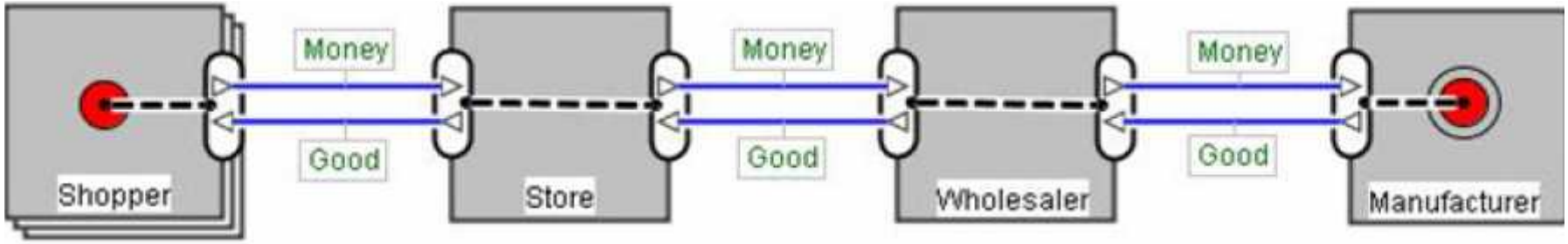
Definitions (1)

- Actor. An actor is perceived by his/her environment as an economically independent (and often also legal) entity. Enterprises and end consumers are examples of actors
- Market Segment. In marketing literature, a market segment is defined as a concept that breaks a market (consisting of actors) into segments that share common properties. They employ the notion of market segment to show that a number of actors assign economic value to objects equally
- Value Interface. Actors have one or more value interfaces. In its simplest form, a value interface consists of one offering, but in many cases, a value interface groups one in-going and one out-going value offering
- Value Offering. A value offering models what an actor offers to (an out-going offering) or requests from (an in-going offering) his/her environment, and closely relates to the value interface concept

Definitions (2)

- Value Object. Actors exchange value objects. A value object is a service, a product, or even an experience
- Value Port. An actor uses a value port to provide or request value objects to or from his/her environment, consisting of other actors
- Value Exchange. A value exchange is used to connect two value ports with each other. It represents one or more potential trades of value object instances between value ports
- Value Transaction. A value interface prescribes the value exchanges that should occur, seen from the perspective of an actor the value interface is connected to, because all ports in a value interface should exchange objects, or none at all

e3value basics



	A	B	C	D	E	F
1	**Value Interface**	**Value Port**	**Value Exchange**	**Occurrences**	**Valuation**	**Economic Value**
2	Buy store	total for Buy store		10000		-900000
3		Good	(all connected)	10000	0	0
4		Payment	Money	10000	90	-900000
5	Sell store	total for Sell store		10000		1000000
6		Payment	Money	10000	100	1000000
7		Good	(all connected)	10000	0	0
8						
9	total for actor			20000	0	100000
10						

value_interface | value_exchange | **Store** | Wholesaler

Case 1: In-hospital diabetes management system (GlucoTab)

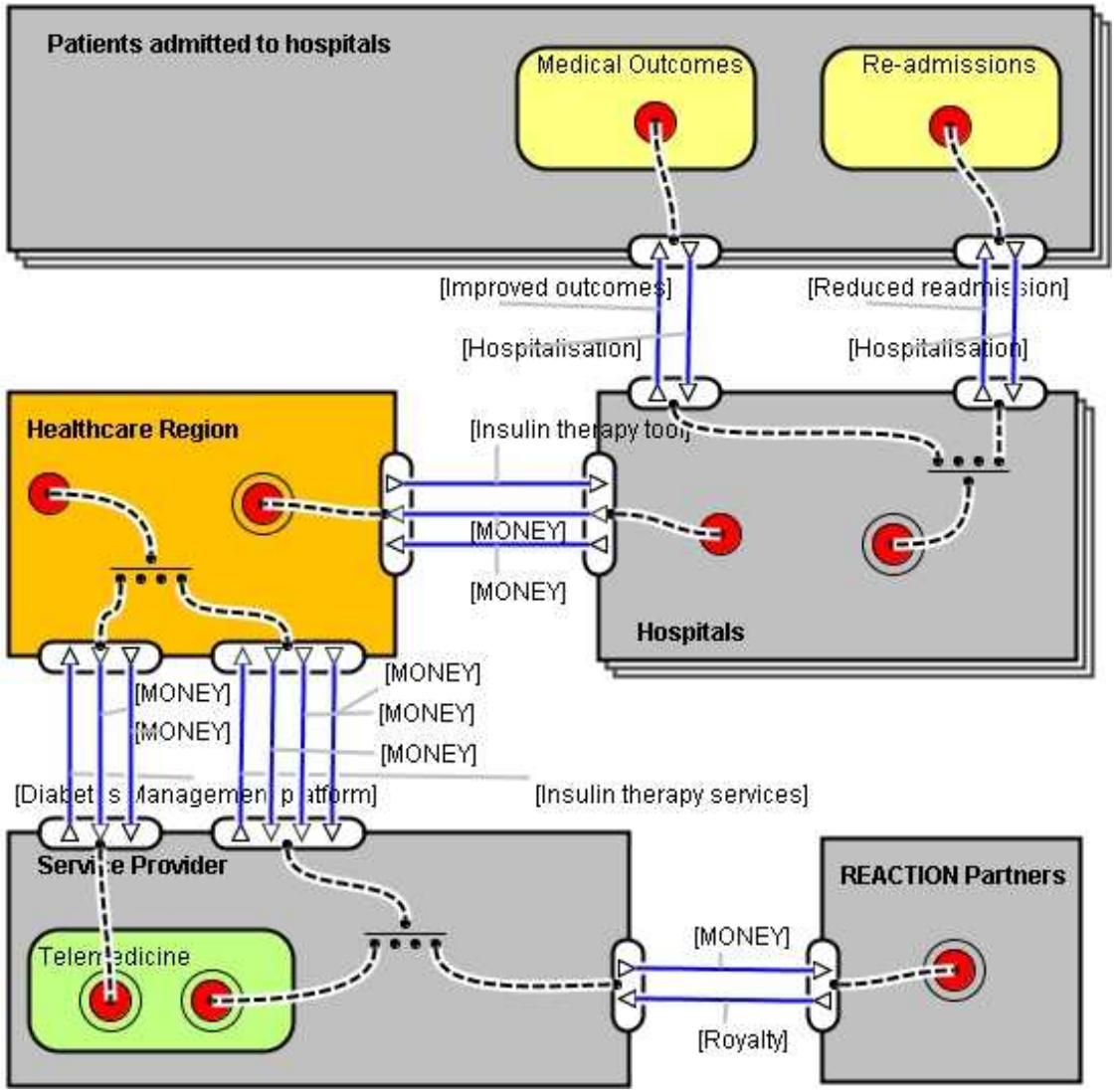
- The GlucoTab frontend is a tablet based mobile client/server application which visualises the most important measurement and insulin administration parameters and provide advice on insulin dosage to the carer
- Patients suffering from diabetes can enjoy continuous glycaemic control during hospital stays
- The In-hospital diabetes management backend is a customised access system to the hospitals own laboratory and EPR systems

Business rationale

- The main medical driver for the diabetes management system is better health outcomes for the hospitalised patients
- Better glycaemic control leads to earlier discharge
- Since patients remain in a better health state after discharge, it also reduces the need for unplanned re-admissions
- Overall, the business driver for the glucose management system is thus a reduction in bed days

- Data from the Capital Region of Denmark (2011) have been used for the business case

Actors and value objects



Assumptions for the business case

Patients:

ICD-10 code	Disease description
DA00-DB99	Infection including parasites
DC00-DD48	Neoplasms
DD50-DD89	Blood and blood-forming organs
DE00-DE90	Endocrine, nutritional, metabolic
DI00-DI99	Circulatory system
DJ00-DJ99	Respiratory system
DK00-DK93	Digestive system

Relevant causes of admission for diabetic patients

Actor: Patients	Value
Total number of admissions (2011) for the seven disease groups for all patients above the age of 60.	146,913
Share of patients with diagnosed diabetes in the population (national average 6.55%)	5.75%
Average number of bed days per admission	3.6
Average re-admission rate	6%

In-hospital business case data for actor Patients

Assumptions for the business case

Hospitals:

Actor: Hospital	Value
Number of hospitals in the region	8
Average number of wards involved in diabetes management (per hospital)	7
Average number of users per ward	10
Potential improvement in bed days from diabetes management	10%
Potential improvement in re-admissions from diabetes management	10%
Average cost per bed day	800€

In-hospital business case data for actor Hospitals

Assumptions for the business case

Service Provider:

Actor: Service Provider	Value
Telemedicine interoperability platform & customisation	150,000€
Hardware costs (terminal, sensors), per user	1,000€
Annual support fee, per hospital	8,000€
Annual service fees for interoperability services, per user	800€
GlucoTab annual service fee, per user	400€
Organisational overhead rate	35%

In-hospital business case data for actor Service Provider

Value transactions in the In-hospital case

Actor / Market Segment (€)	Value object in	Value in		Value object out	Value out	
Patients						
Hospital	Improved outcome			Need for hospitalisation		
Hospital	Reduced re-admission			Need for hospitalisation		
Hospital						
Patients	Need for hospitalisation			Improved outcome		
Patients	Need for hospitalisation			Reduced re-admission		
Healthcare Region	Improved outcome			Savings improved outcome	2.433	k€
Healthcare Region	Reduced re-admission			Savings reduced re-admission	131	k€
Healthcare Region	Insulin therapy tools					
Healthcare Region						
Hospital	Savings improved outcome	2.433	k€			
Hospital	Savings reduced re-admission	131	k€			
Hospital				Insulin therapy tools		
Service Provider	Support			Support fee	64	k€
Service Provider	Integration platform			Backend license fee	336	k€
Service Provider	GlucoTab			GlucoTab licence fee	336	k€
Service Provider	Diabetes management platform			Investment	710	k€
Service Provider						
Healthcare Region	Support fee	64	k€	Support		
Healthcare Region	Backend license fee	336	k€	Delivering backend platform		
Healthcare Region	GlucoTab licence fee	336	k€	Delivering GlucoTab system		
Healthcare Region	Diabetes management platform	710	k€	Deploy platform & hardware		
REACTION partner	GlucoTab rights			GlucoTab royalty	168	k€
REACTION partner						
Service Provider	GlucoTab royalty	168	k€	GlucoTab rights		

Cashflow of actors before and after

Funding and revenues BEFORE telemonitoring:

Segment / actor (I	Revenues	Payments	Expenses	Investments	Cashflow
Patients					
Hospital	25.789				+25.789
Healthcare Region		25.789			-25.789
Service Provider					
REACTION partner					

Funding and revenues AFTER telemonitoring:

Segment / actor (I	Revenues	Payments	Expenses	Investments	Cashflow	Change
Patients						
Hospital	25.789	2.564			+23.224	-2.564
Healthcare Region		23.224	736	710	-24.670	+1.118
Service Provider	1.446	168	329	558	+391	+391
REACTION partner	168				+168	+168

Comments?

Questions?

Case 2: REACTION complex diabetes monitoring and self-management





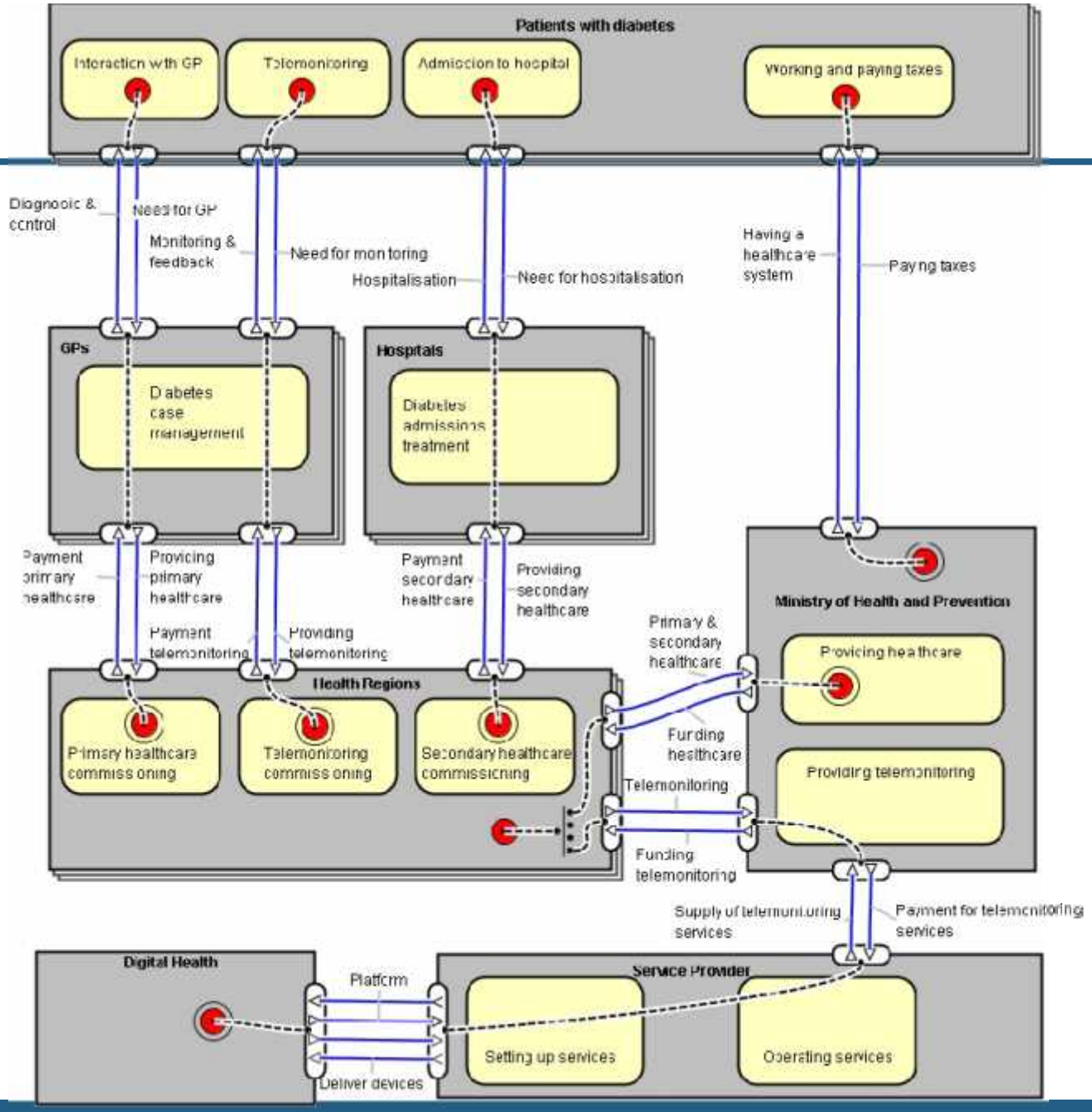

- A primary care service proposition in telemonitoring of vital parameters in diabetic patients
- The service will aim at reducing further complications by offering health control combined with self-management support such as compliance with prescribed antihypertensives, choosing low-fat and low-sodium diets, maintaining regular exercise, and weight control
- The service is planned as a 24/7 multi-parametric monitoring scheme which uses home healthcare devices to provide multi-parametric telemonitoring of the patient's health parameters such as BP, BG, activity, weight, diet and compliance
- The services uses various types of gateways for connection to the health clinic's EPR systems

Business rationale

- The main medical driver for the service is better health outcomes for chronically ill patients; some with multimorbidities
- Since patients remain in a better health state, it also reduces the need for unplanned hospitalisations
- Overall, the business driver for the self-management system is thus a reduction in costs of hospitalisation and fewer visits to the doctor's office

- Data from the UK National Health Services (2009) have been used for the business case

Actors and value objects



Assumptions for the business case

Market segment 1:	Patients	
	Patients	
VAL1	240.000	Total number of actors in the market segment
VAL2	48.000	Number of actors with telemonitoring contract
VISIT1	6	Number of office visits per patient per yr w/o telem.
VISIT2	3	Number of office visits per patient per yr w. telem.
CALIB	300	Calibration factor for counts to make fractions
COUNT	800	Population in market segment
OCC1	1.620	Norm no of visits per year w telemed
OCC2	60	Norm no of telemonitorings
OCC3	300	Norm no of taxpayers
VALUE2	95	Valuation tax payment
VAL3	36.700	Average income (in €)
VAL4	4%	Diabets share of healthcare costs
VAL5	4.400.000	Total number of taxpayers (in k€)
VAL6	10.400.000	Total healthcare funding (k€)

Market segment 2:	GPs	
	GP	
COUNT1	4.100	Total number of actors in the market segment
FRACT1	50%	Share of patients enrolled in case management
FRACT2	20%	Share of patients enrolled in telemonitoring
VAL1	252	Avg. annual fee per patient w/o telem. per GP (in €)
VAL2	251	Avg. annual fee per patient w. telem. per GP (in €)
VALUE1	42,6	Avg. valuation of one visit to GP
VALUE2	107	Valuation of one telemonitoring

101	126,86	Consultation in office (8am – 4pm)
105	49,68	Electronic communication (including other carers)
107	1099,17	Case management of diabetes patients (annual)
2101	43,47	Blood sample for laboratory test
7136	47,44	Blood glucose test in office (photometric)
xxxx	800,00	Telemonitoring fee (annual)

Value transactions

Actor / Market Segment (€)	Value object in	Value in		Value object out	Value out	
Patients						
GP	Diagnosis & Control			Need for GP		
GP	Monitoring & Feedback			Need for monitoring		
Hospital	Hospitalisation			Need for hospitalisation		
Ministry of Health	Having healthcare			Paying taxes	22.691	k€
GP						
Patients	Need for GP			Diagnosis & Control		
Patients	Need for monitoring			Monitoring & Feedback		
Health Region	Payment for primary care	55.244	k€	Providing primary care		
Health Region	Payment for telemonitoring	5.120	k€	Providing telemonitoring		
Hospital						
Patients	Need for hospitalisation			Hospitalisation		
Health Region	Payment for secondary care	42.001	k€	Providing secondary care		
Health Region						
GP	Providing primary care			Payment for primary care	55.244	k€
GP	Providing telemonitoring			Payment for telemonitoring	5.120	k€
Hospital	Proving secondary care			Payment for secondary care	42.001	k€
Ministry of Health	Funding diabetes healthcare	102.481	k€	Providing diabetes healthcare		
Ministry of Health	Funding telemonitoring	0	k€	Providing telemonitoring		
Ministry of Health						
Patients	Taxes paid	22.691	k€	Providing healthcare		
Health Region	Providing diabetes healthcare			Funding diabetes healthcare	102.481	k€
Health Region	Providing telemonitoring			Funding telemonitoring	0	k€
Service provider	Buying telemonitoring service			Paying telemonitoring service	4.676	k€
Digital Health						
Service provider	Sourcing platform			Payment for platform	500	k€
Service provider	Sourcing devices			Payment for devices	9.600	k€
Service provider						
Ministry of Health	Payment for telemonitoring	4.676	k€	Providing telemonitoring serv.		
Digital Health	Payment for platform	500	k€	Delivering platform		
Digital Health	Payment for devices	9.600	k€	Delivering devices		

Cashflow of actors before and after

Segment / actor (k€)	Revenues	Payments	Expenses	Gross profits	Margin	Investments	Cashflow
Patients		22.691					-22.691
GP	60.364			60.364			+60.364
Hospital	42.001		42.000	1	0%		+1
Health Region	102.481	102.365		116	0%		+116
Ministry of Health	22.691	102.481	4.676				-84.466
Digital Health						10.100	-10.100
Service provider	4.676		4.271	405	9%	-100	+505

Funding and revenues BEFORE telemonitoring:

Segment / actor (k€)	Revenues	Payments	Expenses	Cashflow
Patients		22.691		-22.691
GP	60.480			+60.480
Hospital	46.667		46.667	
Health Region	107.147	107.147		
Ministry of Health	22.691	107.147		-84.456
Digital Health				
Service provider				

Funding and revenues AFTER telemonitoring:

Segment / actor (k€)	Revenues	Payments	Expenses	Cashflow	Change
Patients		22.691		-22.691	
GP	60.480			+60.480	
Hospital	42.001		42.001		
Health Region	102.481	102.481			
Ministry of Health	22.691	102.481	4.676	-84.466	-10
Digital Health					
Service provider	4.676		4.271	+405	+405

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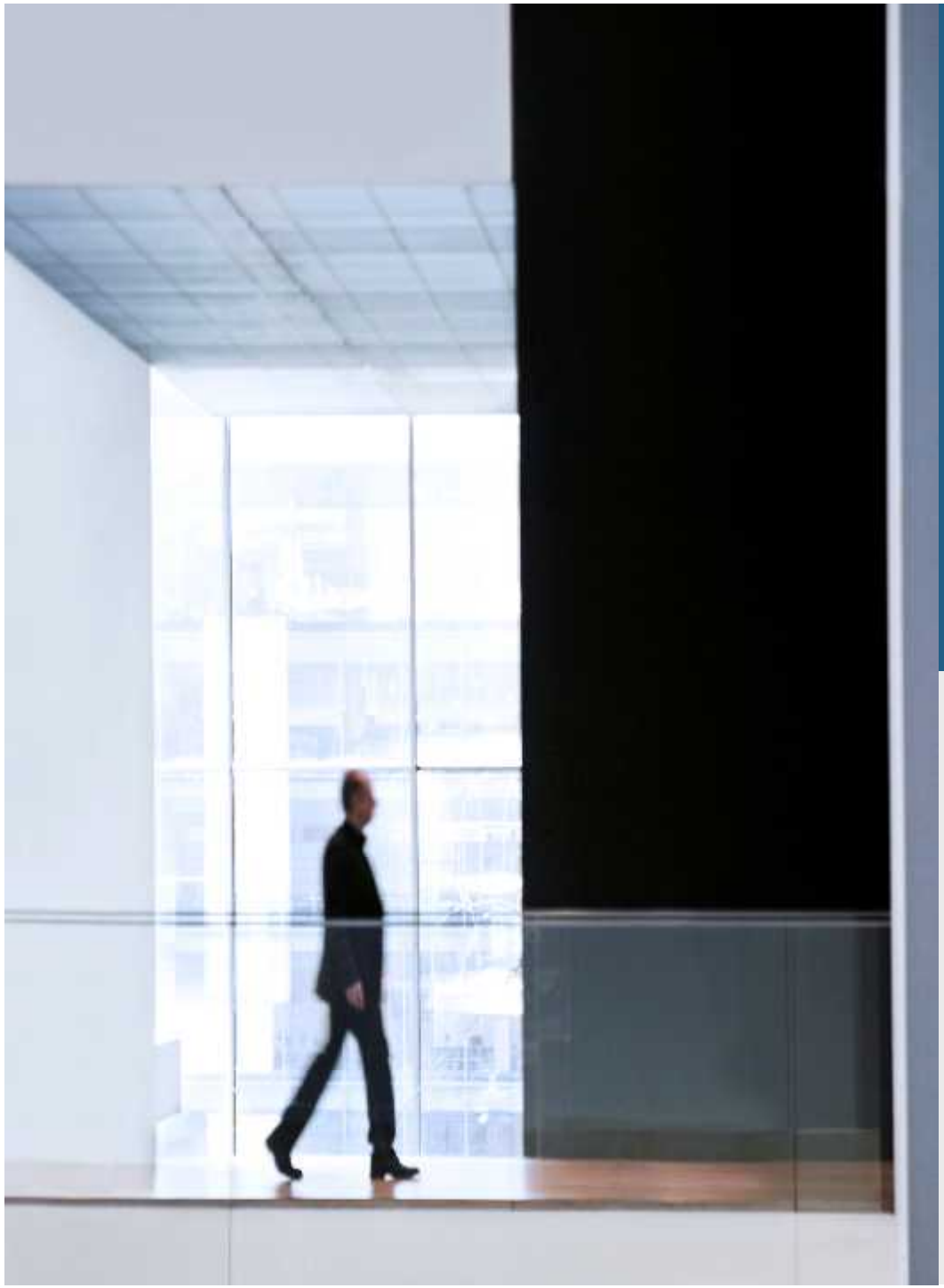

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Thanks for your attention

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