

# STORIES FROM THE TRENCHES

## PARTITIONING AS A DESIGN PATTERN

ITU 2014

Kennie Nybo Pontoppidan

# Who am I?

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$$\frac{dx}{\sqrt[3]{x^3 + \sqrt{x^2}}} = \frac{dx}{\sqrt[3]{x^3 + \sqrt{x^2}}} = \left[ \begin{array}{l} \sqrt[3]{x} = E \\ x = E^3 \\ dx = 3E^2 dt \end{array} \right] = \frac{6t^2}{t^3 + t^2}$$

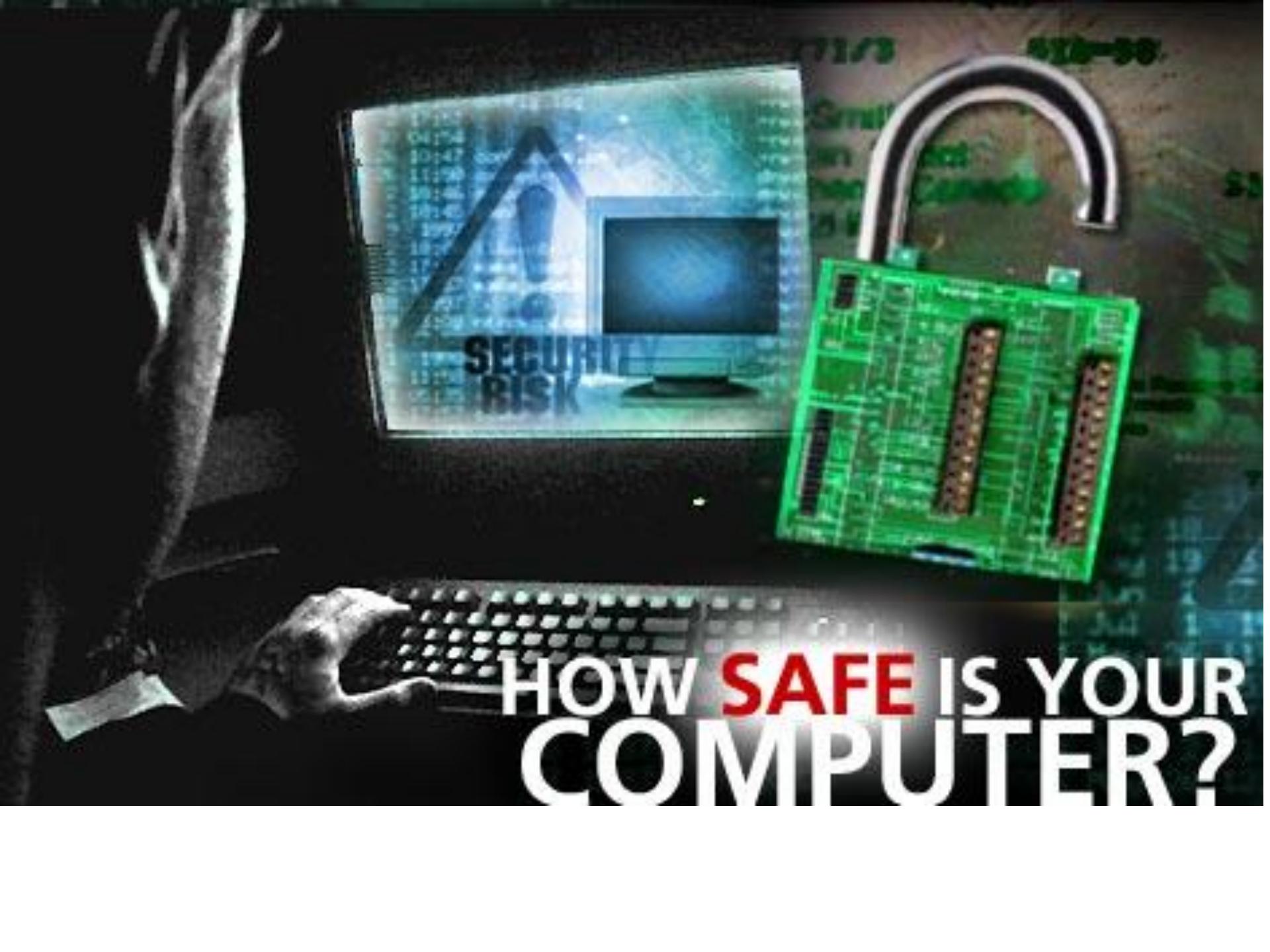
$$\frac{6t^2}{t^3 + t^2} \left( \frac{\frac{1}{t^3 + 1}}{t - 1} - \frac{1}{t + 1} \right) dt = 6 \left( t^2 \cdot t + 1 - \frac{1}{t + 1} \right) + C =$$

$$+ E - Cn |E| + C =$$

$$\frac{x^2}{2} + f_x \cdot (n | \sqrt[3]{x^3 + 1} | ) + C$$

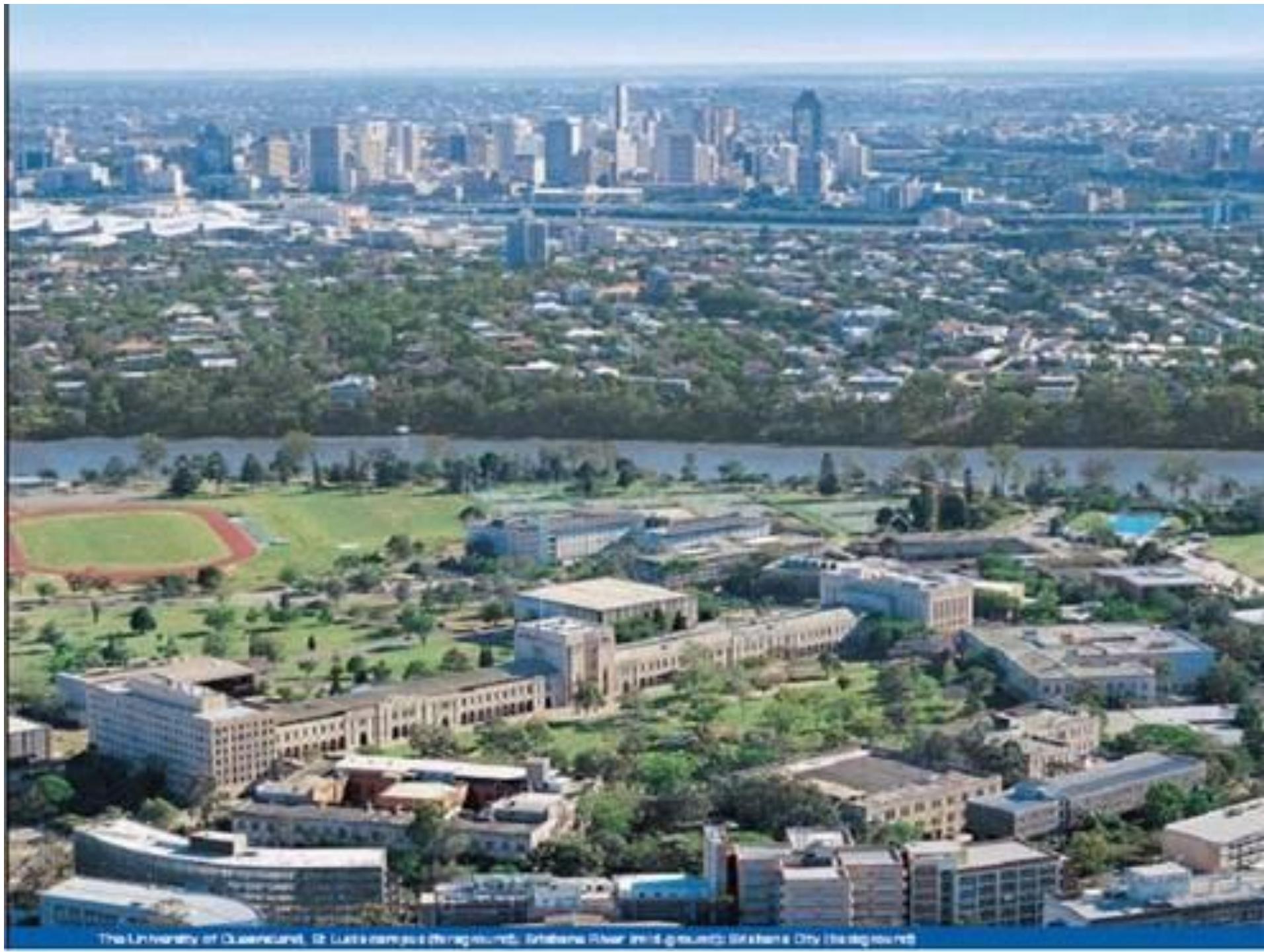






**HOW SAFE IS YOUR COMPUTER?**





The University of Queensland, St. Lucia campus in the foreground, Brisbane River and @unimelb@unimelb City in the background





THE BELL CURVE

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TALK NERDY TO ME



# CONSULTING

IF YOU'RE NOT A PART OF THE SOLUTION,  
THERE'S GOOD MONEY TO BE MADE IN PROLONGING THE PROBLEM.

# EFFEKTOR

## Self Service Datawarehousing



Rehfeld Effektor delivers a platform for a full BI-solution supporting all relevant needs importing source system data over data warehousing to reporting both on relational cubes. The platform is built around the concepts of ease of use: working with your data changes to structure and/or data should not require deep technical expertise.

### A HEALTHY ARCHITECTURE FOR THE DATA WAREHOUSE

The core in Effektor is a data warehouse architecture modeled after industry standards. This ensures reuse of code and stability of implementations on Effektor. The enterprise data warehouse (EDW) in Effektor looks like how you would do it in a hand





BØRSEN.  
GAZELLE 2011



ORACLE®

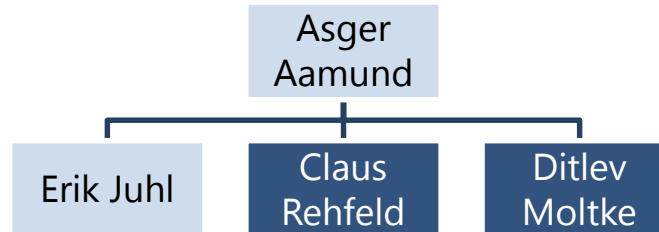


QlikView  
Partner

Microsoft®  
GOLD CERTIFIED  
Partner

- Rehfeld er en af Danmarks største leverandører af Business Intelligence og Ledelsesinformation, og har siden 1998 udviklet og implementeret løsninger i samarbejde med vores offentlige, statslige og private kunder.
- Rehfeld råder over 60 af landets dygtigste BI-konsulenter der forstår at binde forretningskritiske problemstillinger sammen med BI-løsninger for en optimal og effektiv løsningsmodel.
- Vi har dyb indsigt indenfor de brancher vi beskæftiger os med, og vores fokus er at understøtte organisationernes beslutningsprocesser, så de beslutninger der bliver taget, baseres på et informeret grundlag.
- Vi leverer skræddersyede løsninger som fokuserer på organisationernes behov.

# Bestyrelse



## Eksterne medlemmer



### Asger Aamund (formand)

Nuværende:  
Direktør for A.J. Aamund A/S  
Formand for bestyrelsen for Bavarian Nordic A/S

Historisk:

- A.J. Aamund A/S
  - Eneaktionær og direktør, 1992 – DanoChemo A/S –
  - Hovedaktionær og best.formand, 1988-92
- Den danske Ferrosan-Gruppe
  - Adm. direktør 1981-88
- Den danske Ferrosan-Gruppe
  - Koncerndirektør 1980-81
- Rockwool International A/S
  - Koncerndirektør, 1977-80
- Goriværk A/S
  - Direktør, 1974-77



### Erik Juhl

2004-2009  
Forskningschef, Lundbeckfonden  
Medlem af regeringens sygehuskommissioner 1997 og 2002. Statsministerens personlige repræsentant ved (Rundrejse i det Danske Sygehusvæsen), udarb. af regeringskvalitetsreform 2007.  
Formand for regeringens internationale ekspertpanel vedr. prioriteringen af 40-mia.puljen til større sygehusinvesteringer siden 2007.

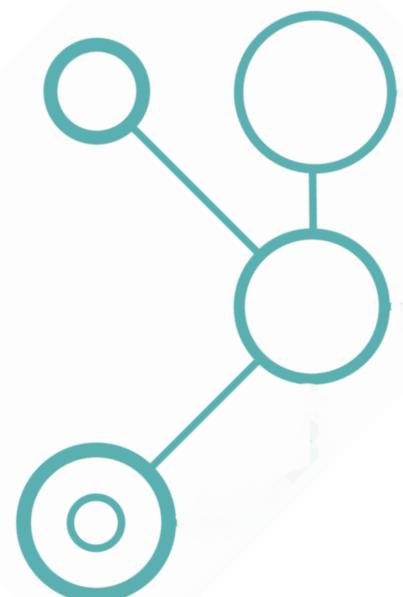
1978 - 2004  
Cheflæge, Hvidovre Hospital  
Lægelig Direktør, Københavns Hospitalsvæsen  
Lægelig Direktør, Københavns Sundhedsvæsen  
Sundhedsdirektør, Københavns Sundhedsvæsen  
Adm. Direktør for Hovedstadens Sygehusfællesskab  
Overlæge ved Enhed for Patientsikkerhed

# Kompetencer

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- Data warehousing
  - Master data management
  - Arkitektur
  - ETL
  - OLAP
- Business Intelligence
  - KPI og scorekort
  - Rapporter
  - Brugervenlighed



# Teknologier

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## EFFEKTOR



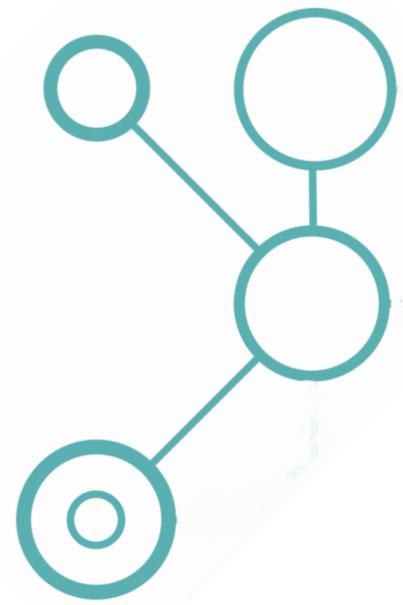
Excel 2010/2013  
PowerPivot

# Brancher

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- Privat
  - Detailhandel
  - Forsyning
  - Manufacturing
  - Media
  - Pharma & Medico
- Public
  - Kommuner
  - Regioner
  - Stat
  - Sundhed



# Udvalgte kunder - Regioner & stat



**UNI•C**



MINISTERIET FOR  
BØRN OG  
UNDERVISNING



Sundhedsstyrelsen



# Udvalgte kunder - Kommuner



KØBENHAVNS KOMMUNE



ROSKILDE  
KOMMUNE



ODENSE KOMMUNE



Esbjerg  
Kommune



AARHUS  
KOMMUNE



Herning  
Kommune

FREDERIKSBERG  
KOMMUNE



Helsingør  
Kommune



GENTOFTE KOMMUNE



SLAGELSE  
KOMMUNE



Silkeborg  
Kommune

# Fortsat..



RØDDOVRE KOMMUNE



HØRSHOLM KOMMUNE



HVIDOVRE  
KOMMUNE



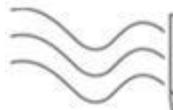
Albertslund Kommune



HØJE-TAASTRUP  
KOMMUNE



KERTEMINDE  
KOMMUNE



Egedal  
Kommune



JAMMERBUGT  
KOMMUNE

FAXE KOMMUNE

HØRSENS KOMMUNE



SKIVEKOMMUNE



Hjørring Kommune



HOLBÆK  
KOMMUNE



HADERSLEV



Greve  
Kommune



GLADSAXE



BORNHOLMS  
REGIONSKOMMUNE

# Udvalgte kunder – Health care



**Rigshospitalet**



REGION SJÆLLAND  
ROSKILDE SYGEHUS  
*- vi er til for dig*



Region Syddanmark  
Sydvestjysk Sygehus



UNIVERSITETSSYKEHUSET NORD-NORGE  
DAVVI-NORGGA UNIVERSITEHTABUOHCEVISSU



**Glostrup  
Hospital**



**Herlev  
Hospital**



**Frederiksberg  
Hospital**



**Hvidovre  
Hospital**



**Amager  
Hospital**



**Hillerød  
Hospital**



Region Syddanmark

OUH  
Odense Universitetshospital  
Svendborg Sygehus

# Udvalgte kunder – Private virksomheder



**SKANSKA**

WUNDERWEAR  
*for you*

**FOSS DONG**  
energy

**groupm**

**PFA**  
PENSION



**novozyymes®**  
Rethink Tomorrow

 VESTFORBRÆNDING

**ENERGINET./DK**

  
**novo nordisk®**

# Program

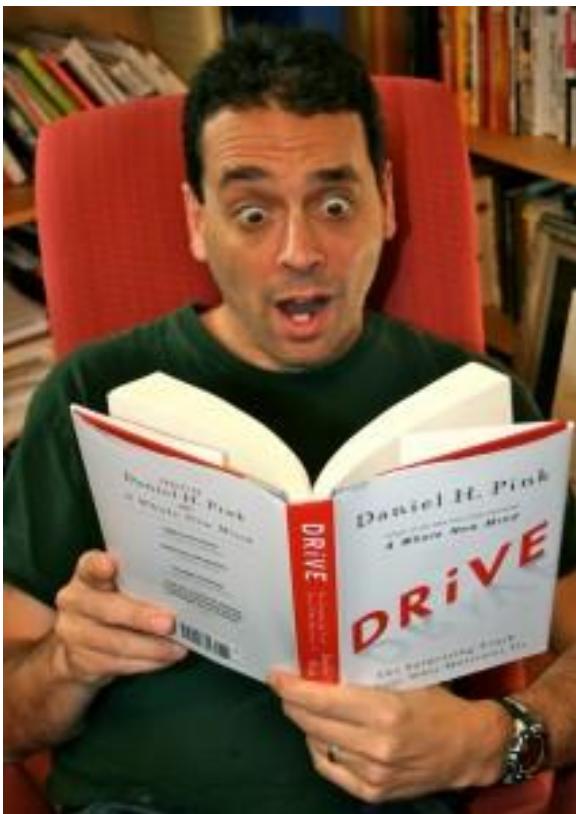
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- About the FLIS project
- Data warehouse heroes and architecture
- Partitioning in many disguises

# Warning!

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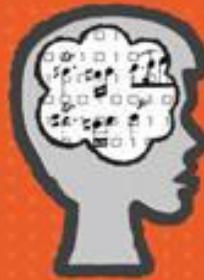


The New York Times and BusinessWeek Bestseller

"THIS BOOK IS A MIRACLE. Completely original and profound."  
—Tom Peters, author of *In Search of Excellence*

UPDATED  
WITH NEW  
MATERIAL

## A WHOLE NEW MIND

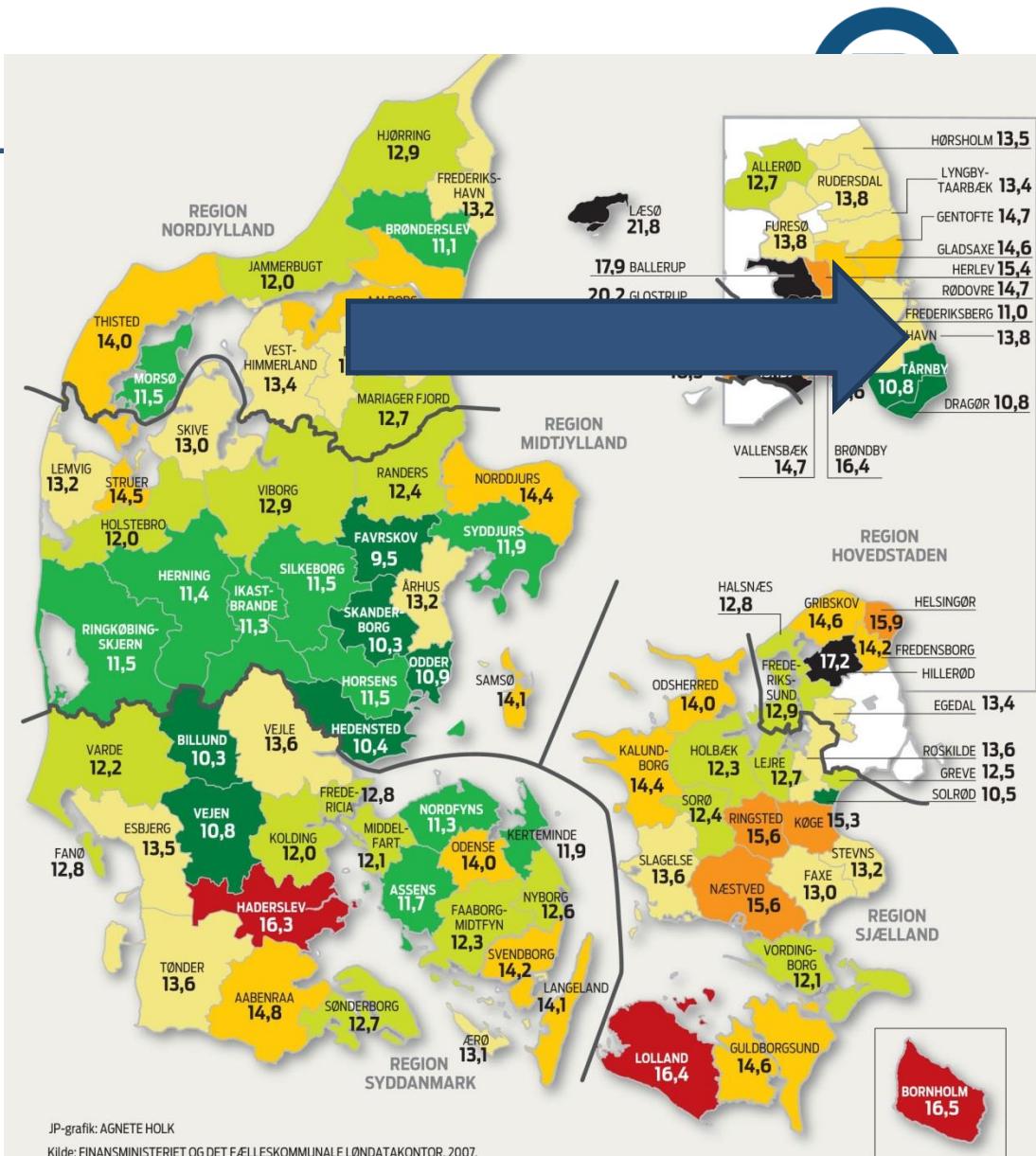


WHY RIGHT-BRAINERS  
WILL RULE THE FUTURE

DANIEL H. PINK

# Municipality

You are here



# The FLIS project - Team



- Netcompany  
75%
  - Rehfeld  
25%
  - TDC hosting



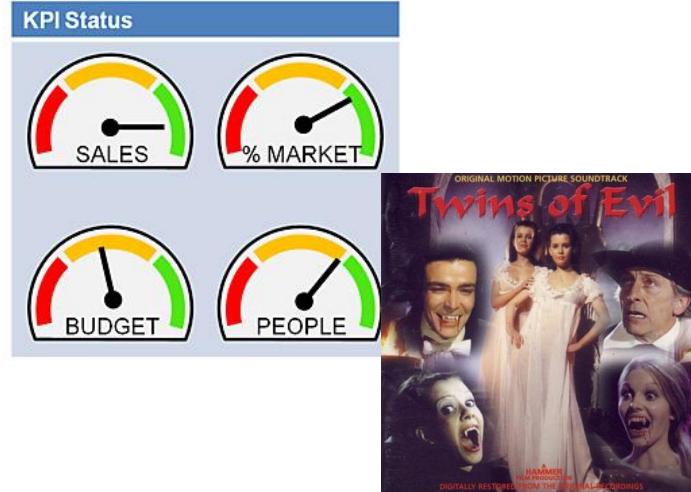
**Rehfeld**



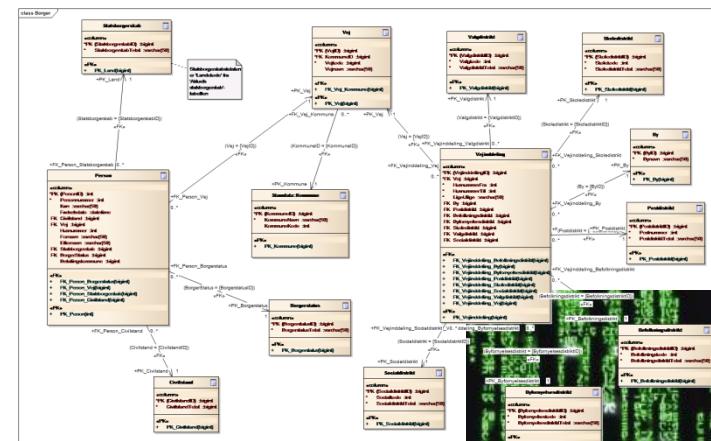
# The FLIS project - Mission



- Jointly defined KPI's
  - View your own KPI's
  - Benchmark with "twins"



- Access to your own data
  - Common datamodel
  - Raw data



# Access to your own data?

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- ~ 72 mill. kr. to get data for 4 years
- (10 mill. euro)

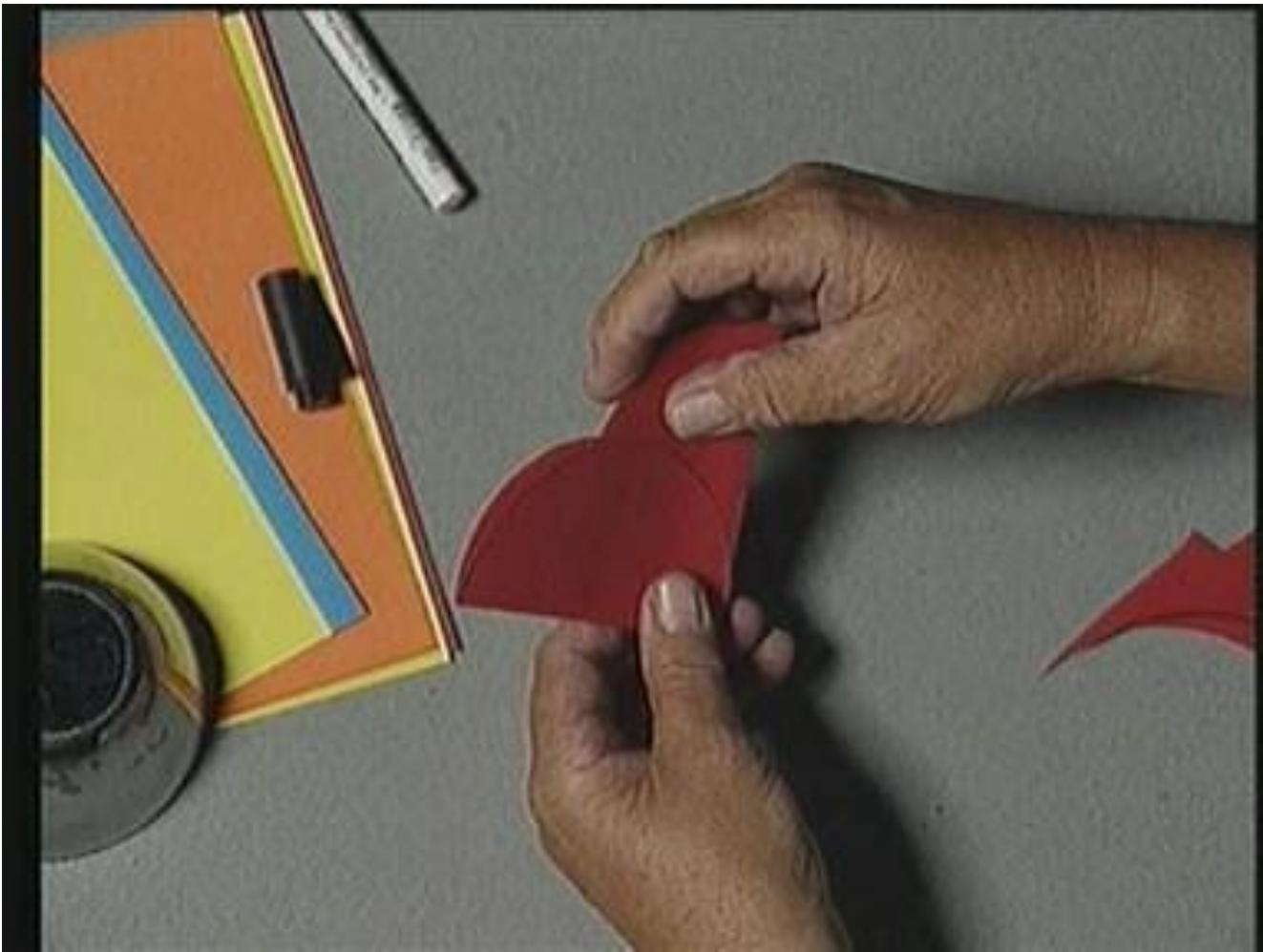


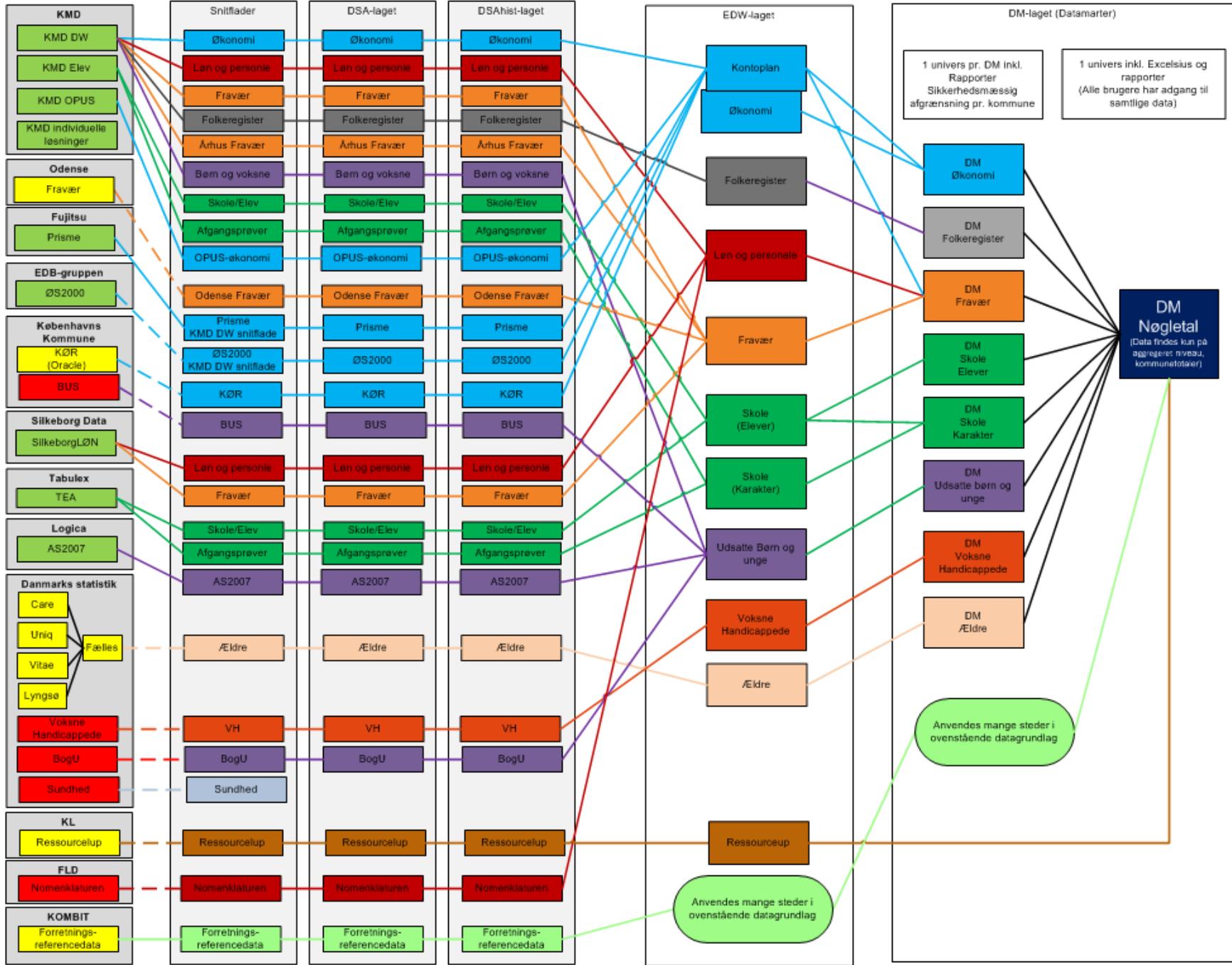
# The FLIS project – DW Challenges

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- Data from 30 different it-systems
- 7 subject areas
  - Citizens
  - Employees
    - Salaries
    - Absence
  - ERP
    - Budgets
    - Postings
  - Schools
  - ...
- Conformity
  - Within area
  - Between areas





# FILOSOFI OG PROCES

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Vores tanker om  
ledelsesinformation

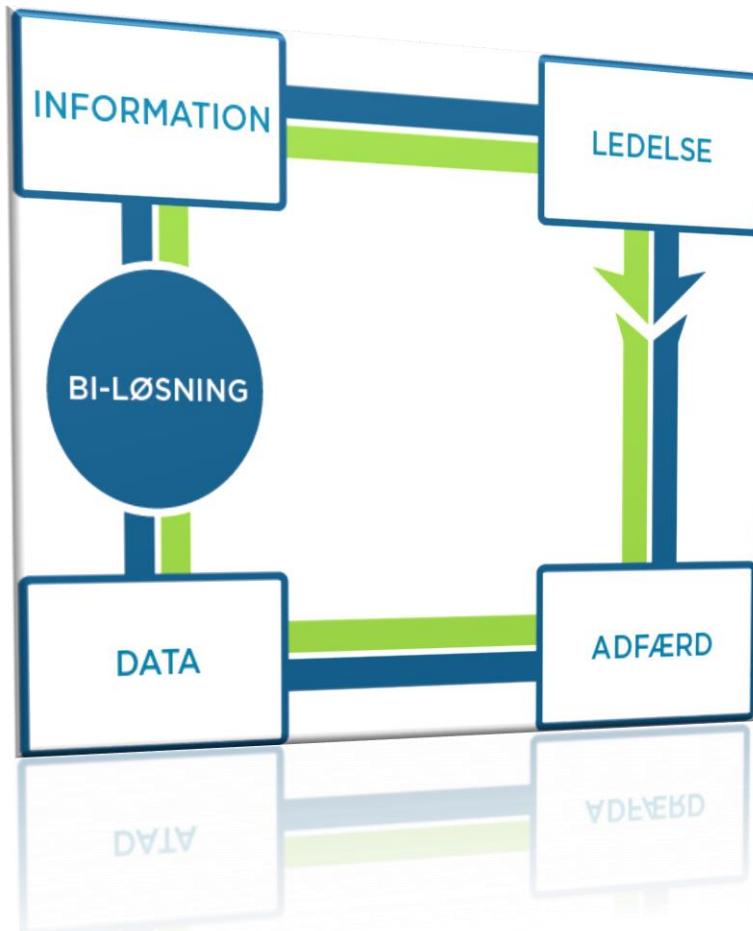


# Ledelsesinformation - cyklussen



Rehfeld vision

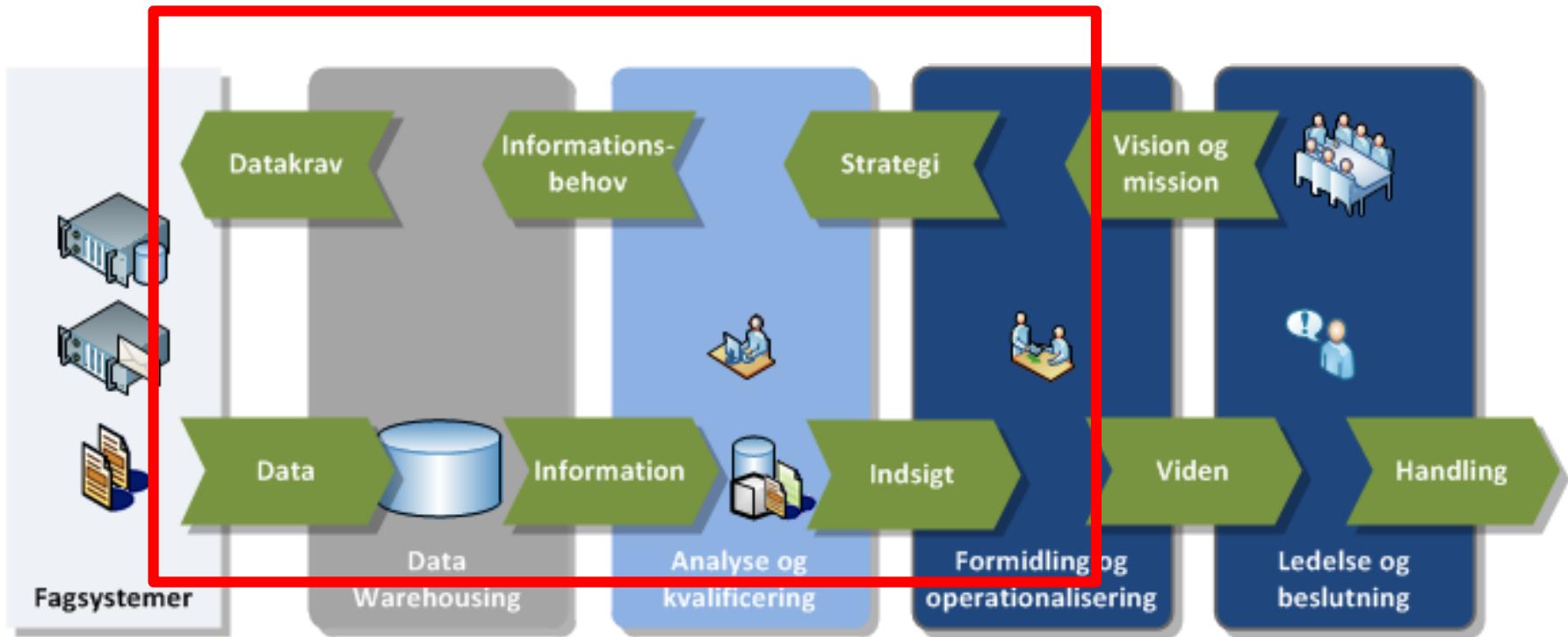
At gøre Danmark til et mere effektivt samfund ved at optimere ledelsesmæssige beslutningsprocesser



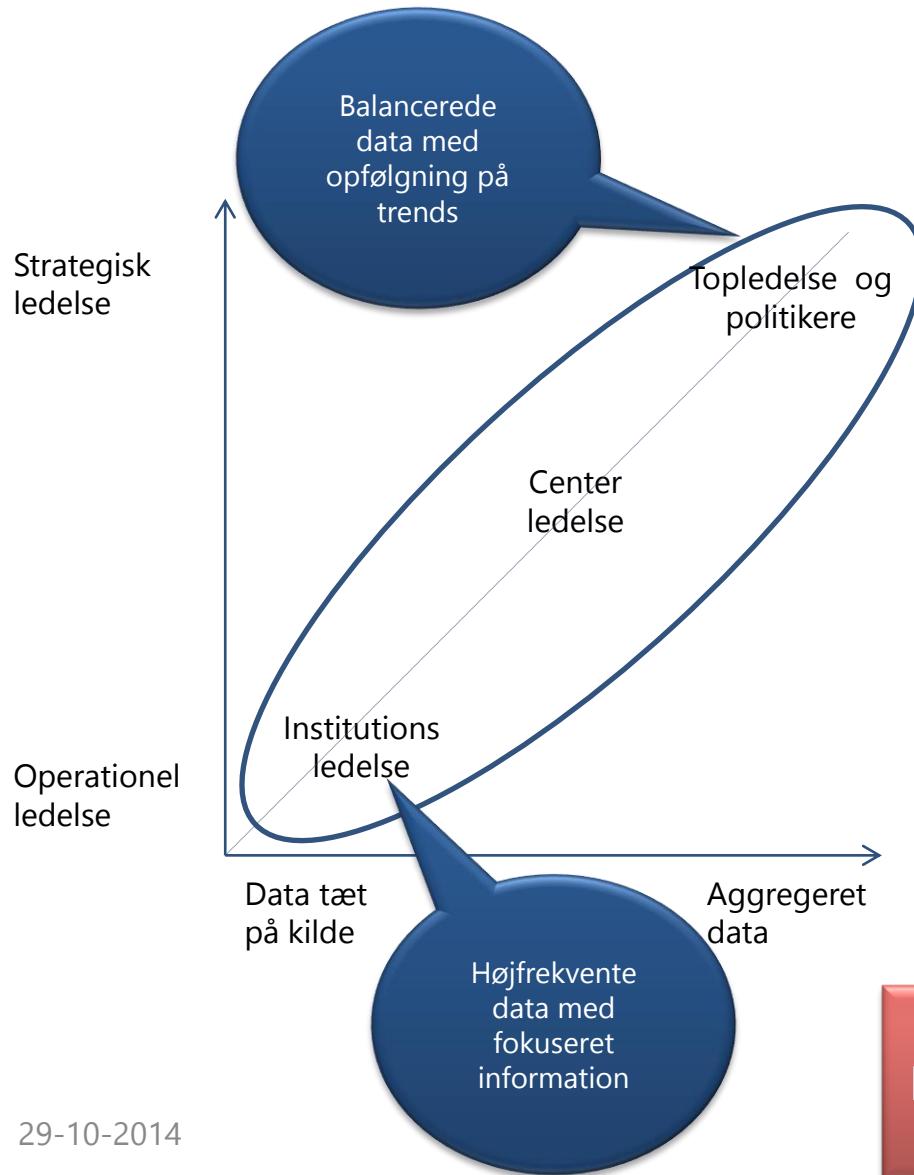
Starter ved ledelse og skal understøtte ledelsens informationsbehov i forhold til at sikre den optimale adfærd



# Business intelligence som en værdikæde



# Overvejelser om data og ledelse



## Strategisk ledelse

- Bredt overblik, mange områder
- Langsigtede beslutninger
- Måske Særlige fokusområder
- Typisk baseret på generel målopfyldelsesdiskussion

## Operationel ledelse

- Specifik fokus på specifikke processer og områder
- Beslutninger om handlinger der har umiddelbar effekt

HUSK AT INFORMATIONERNE SKAL  
BASERE SIG PÅ DET SAMME GRUNDLAG.  
UANSET LEDELSESNIVEAU



# Processen er afgørende!

**Evaluér effekten** så vi kan lære af vores processer

Kender I effekten af jeres beslutninger?

**Opbyg rapporterings-system** som understøtter de foregående processer

Kan I distribuere jeres informationer?

**Find reaktionsmulighederne** så folk kan reagere fornuftigt og i tide

Kender I processerne der understøtter målene?

**Analysen** skal gennemføres for at sikre at der er et potentiale

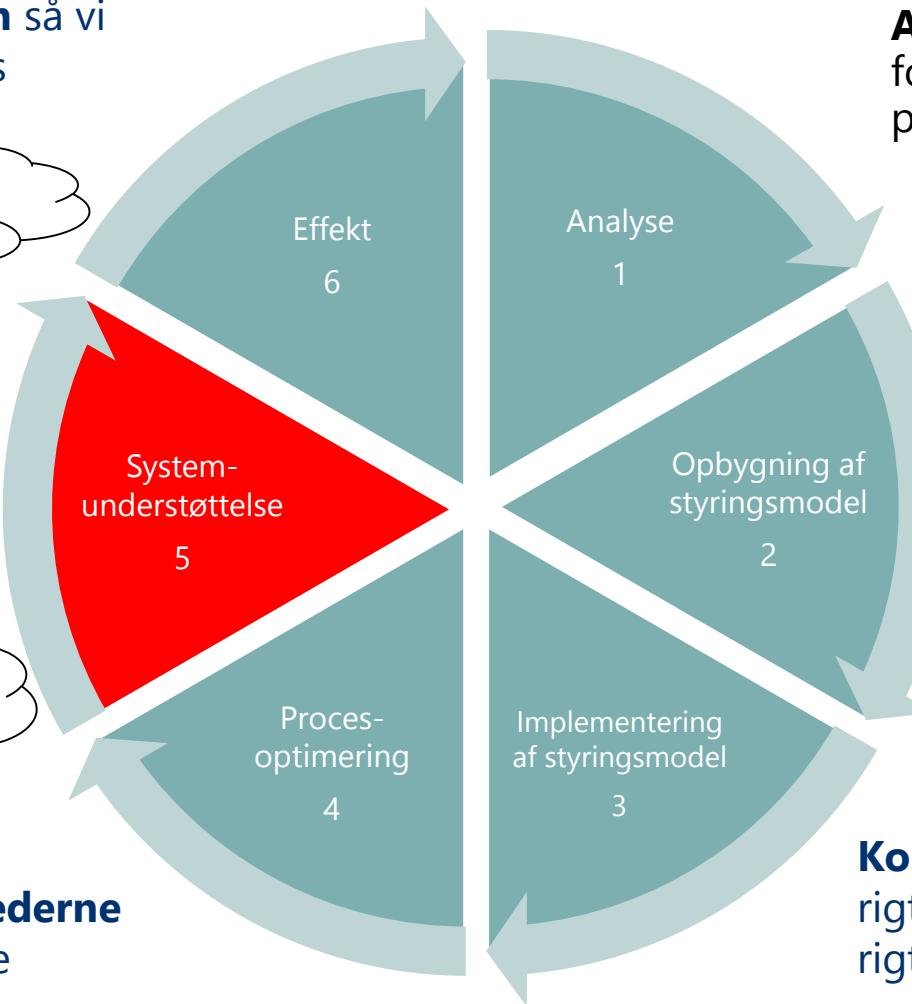
Kender I jeres potentiale?

**Styringsmodellen** understøtter at de opstillede målsætninger er forståelige

Har I defineret jeres målsætninger?

**Kommunikation** til de rigtige mennesker på det rigtige tidspunkt

Ved I hvem der er ansvarlige for de enkelte mål?



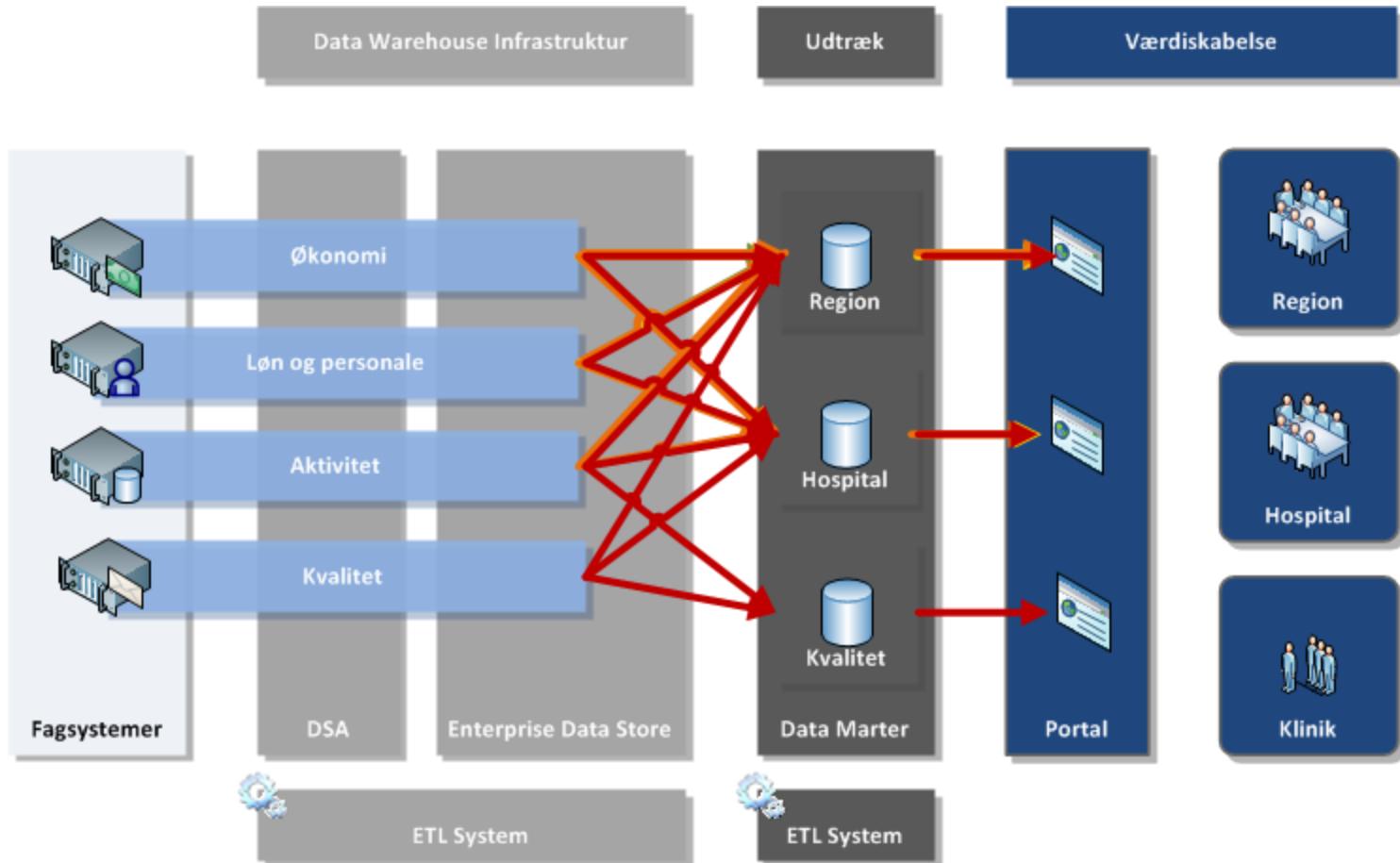
# DATA WAREHOUSING

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On Enterprise Data Warehouse  
Architecture



# On complexity

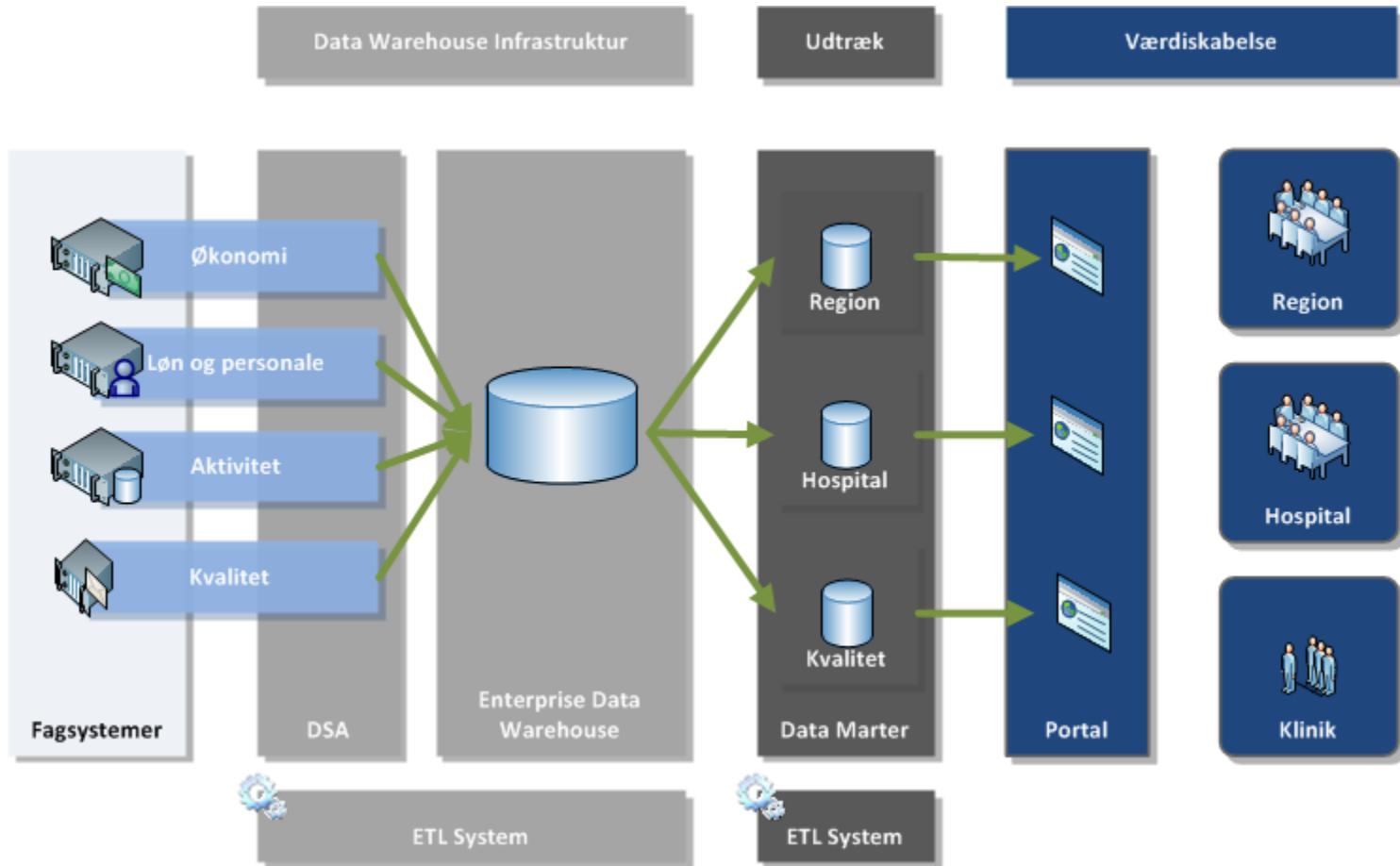


# On complexity

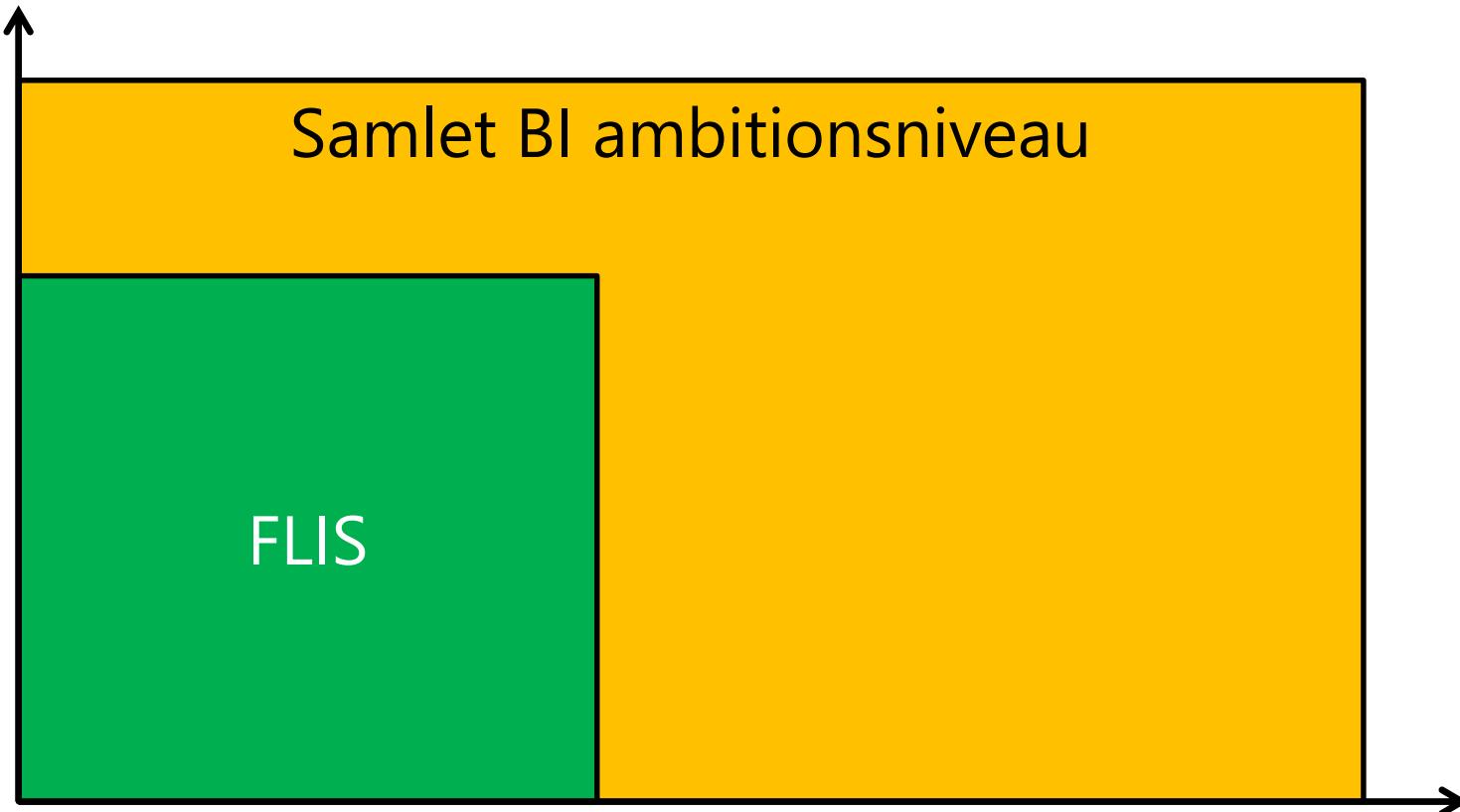


	Mål	Kalender og tid	Patient	Diagnose	Personale	Organisation	Kontoplan	Dimensioner
Økonomi	x	x	x					x
Status	x	x						x
Indtægter	x	x						x
Udgifter	x	x	x					x
..								
Løn		x	x					x
Fremmøde		x	x					x
Ferie			x					x
..								
Aktivitet på sygehuse		x	x	x	x	x		x
Sengedage		x	x	x	x	x		x
Kapacitet		x	x	x				x
..								
Aktivitet i primærsektor		x	x	x	x	x		x
Lægebesøg		x	x			x		x
Kapacitet		x	x					x
..								
Kvalitet		x	x	x	x	x		x
Visitationer		x	x	x	x	x		x
Iværksat behandling		x	x	x	x	x		x

# Consolidation in a DW



BI-niveau



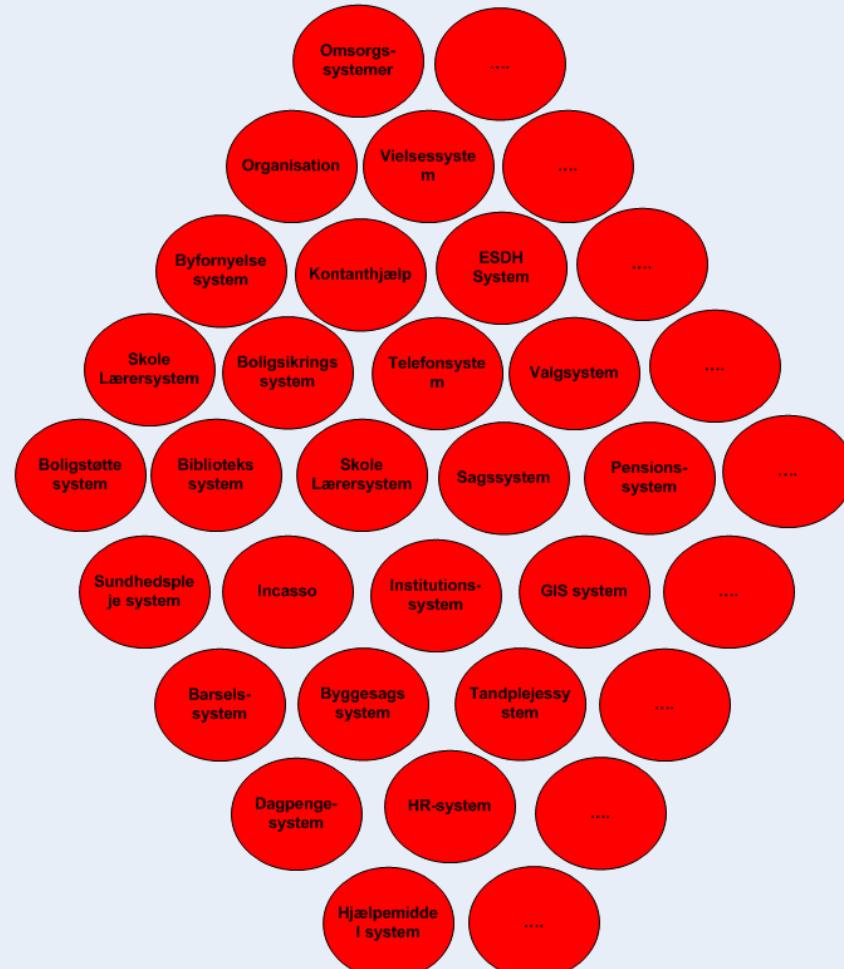
# FLIS version 1 – Hvor meget er indeholdt?



Indeholdt i FLIS version 1



Ikke indeholdt i FLIS version 1



# Data warehouse heros

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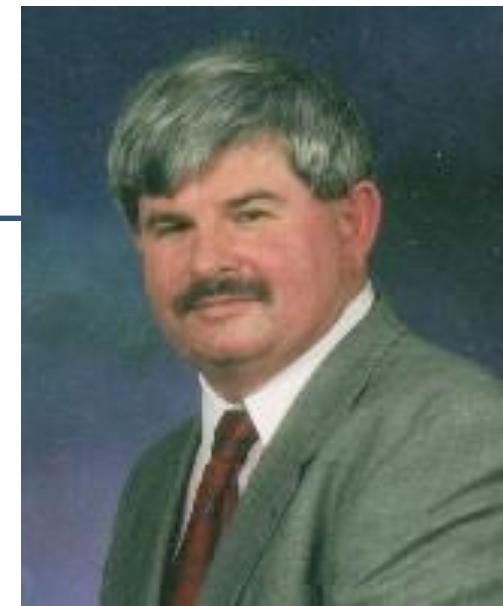


Bill

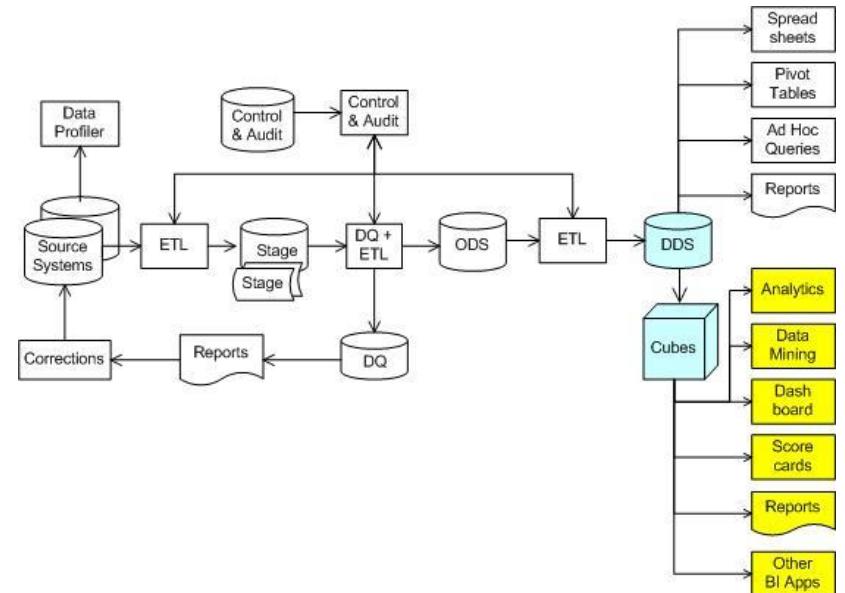
Ralph

Dan

# Bill Inmon



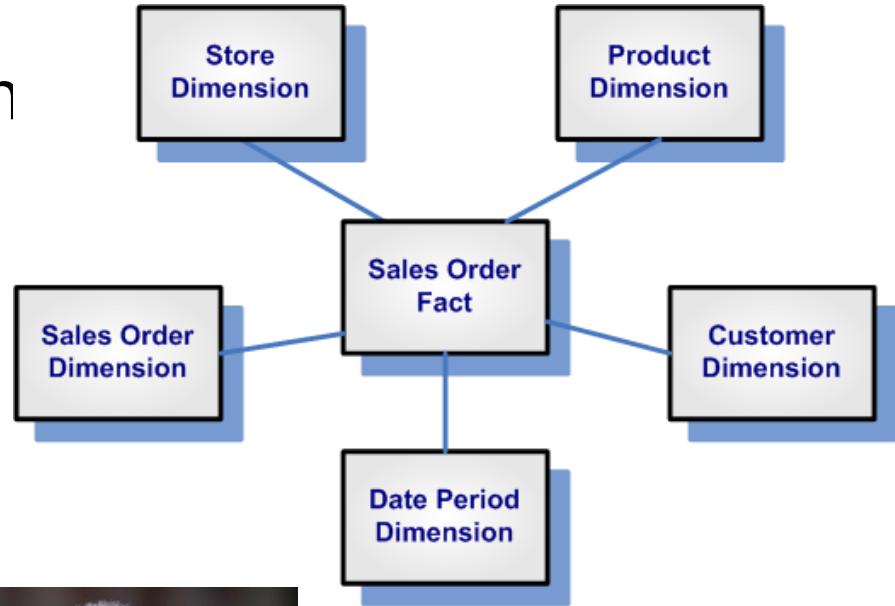
- Inventor of the word
  - Data warehouse
- Oracle reference architecture
- Top down approach



# Ralph Kimball



- “Invented” dimension modelling



- Microsoft “reference architecture”

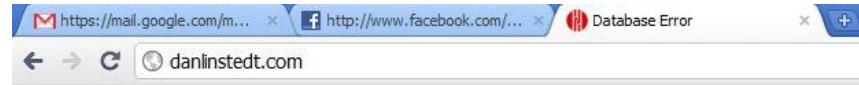
- Bottom up



# Dan Lindstedt

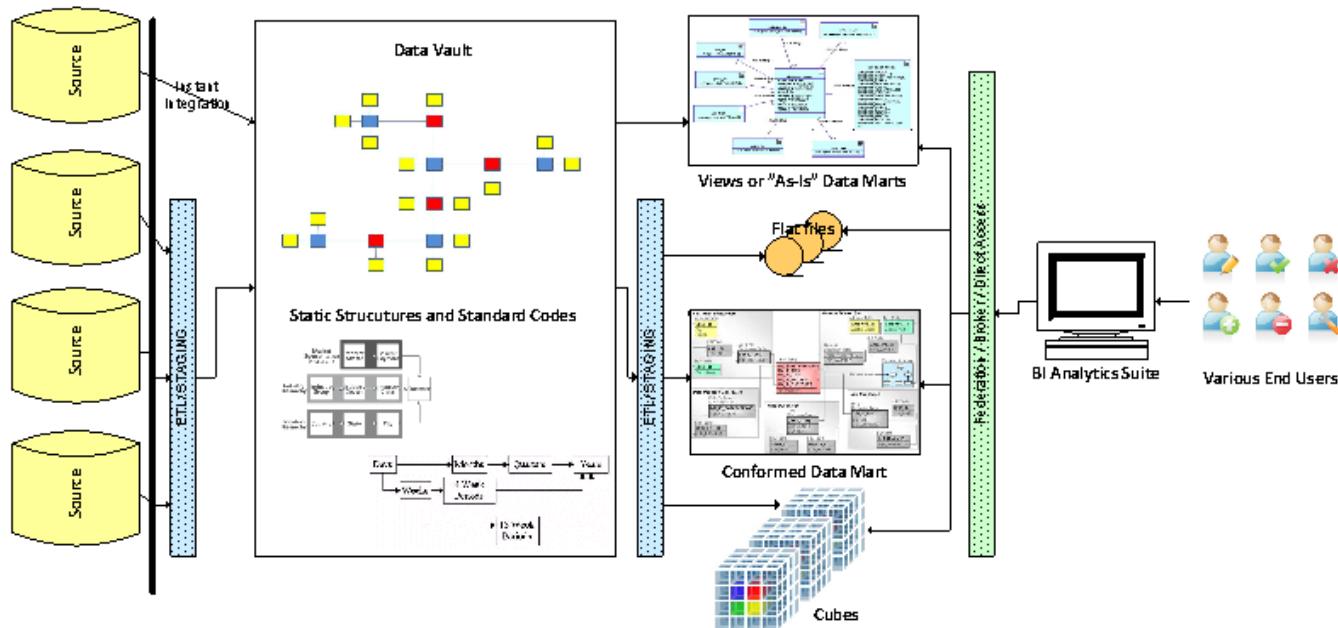


- Hybrid model

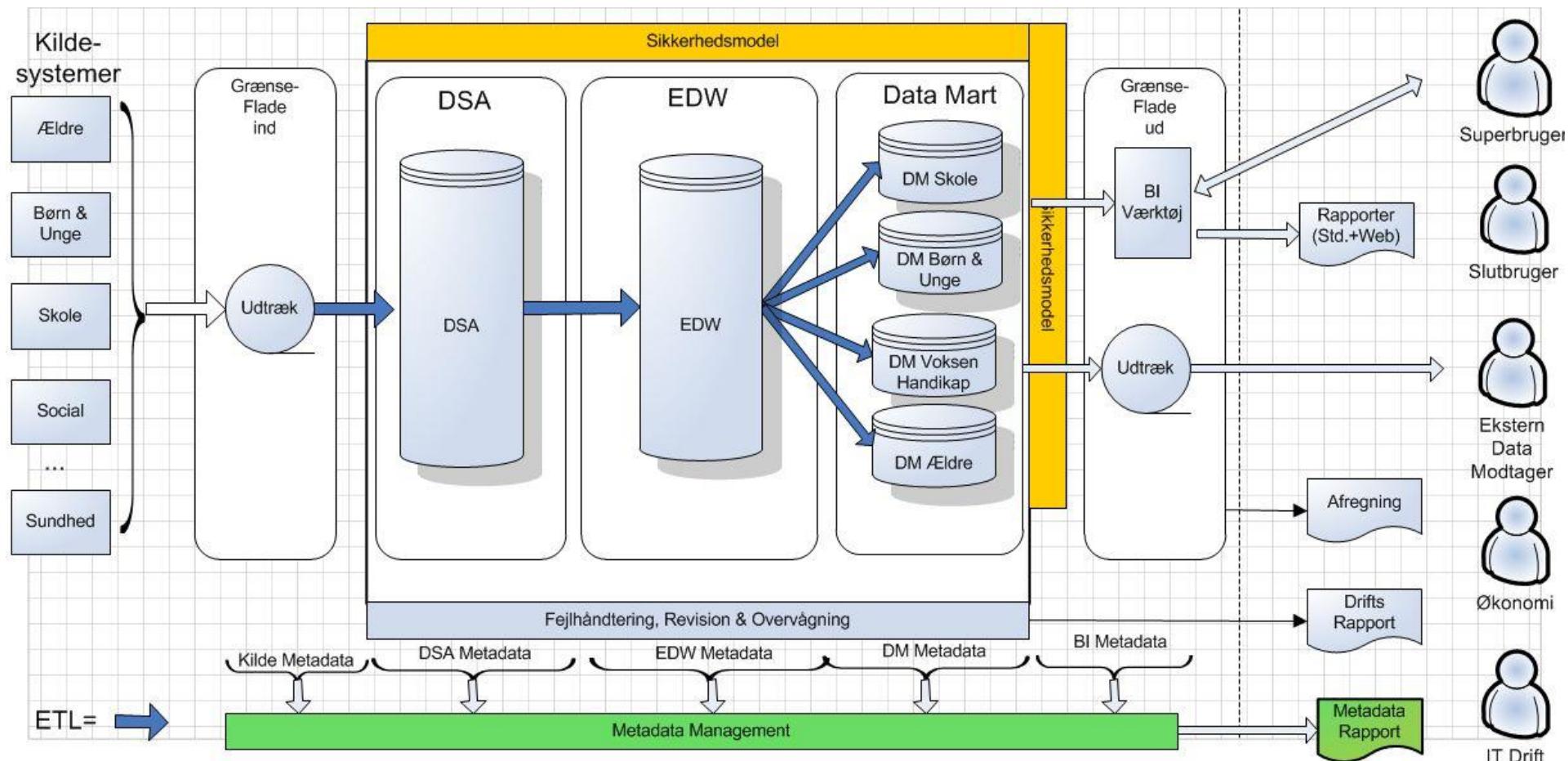


Error establishing a database connection

- Hubs, satellites and Links

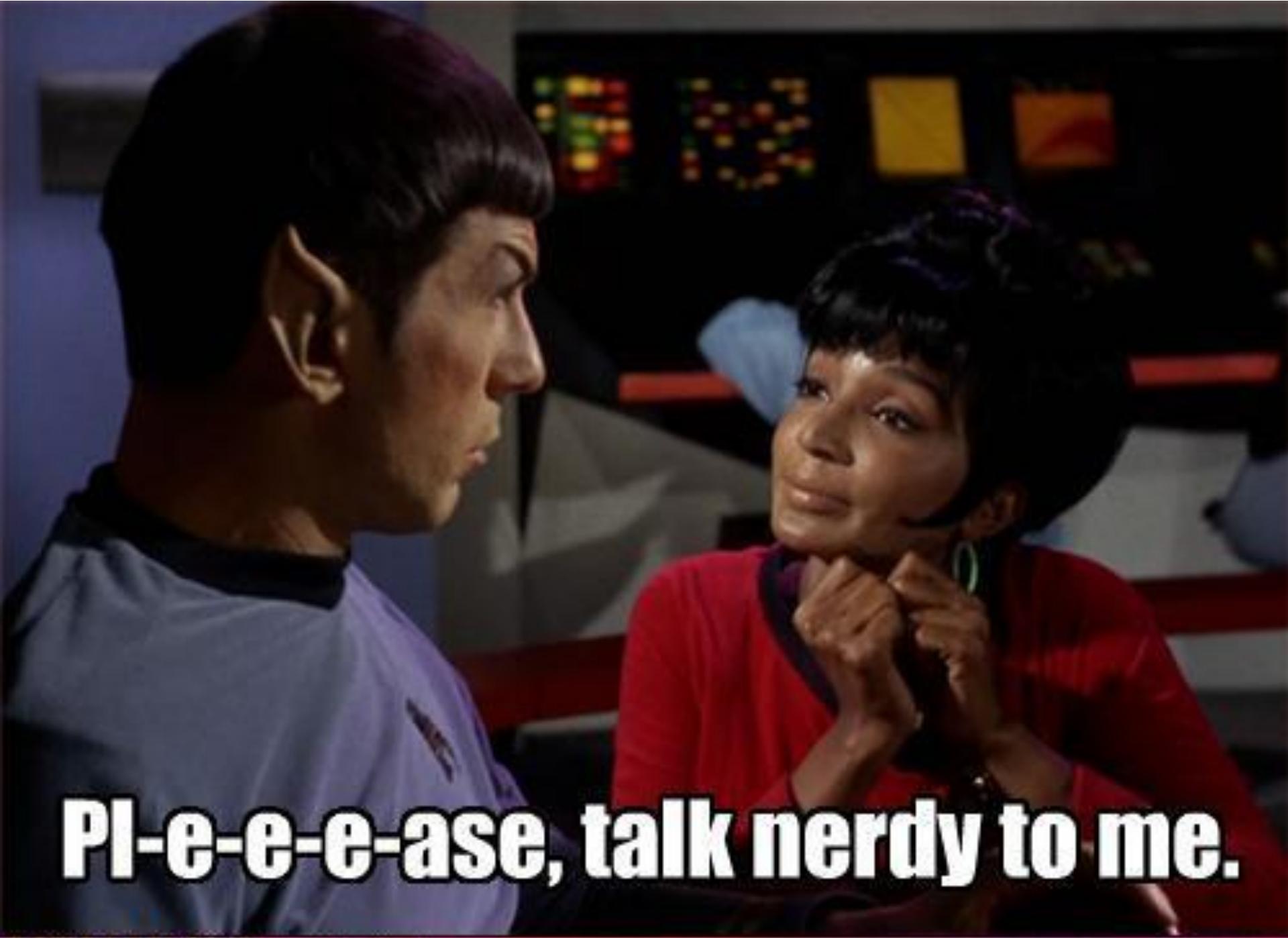


# FLIS Data Warehouse Architecture



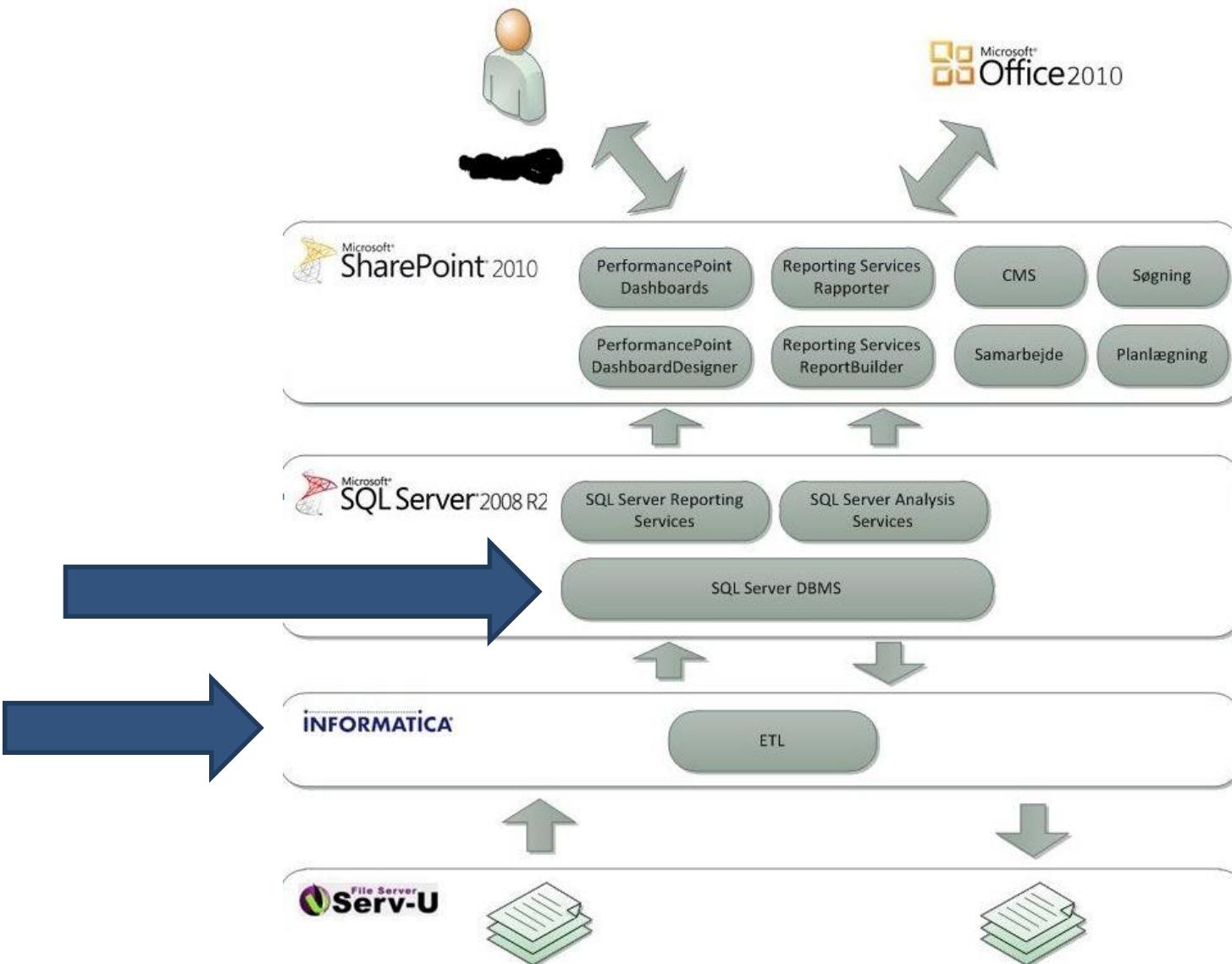


WOULD YOU LIKE TO KNOW MORE?



**PI-e-e-e-a-se, talk nerdy to me.**

# Technologies



# Squirrel server ?

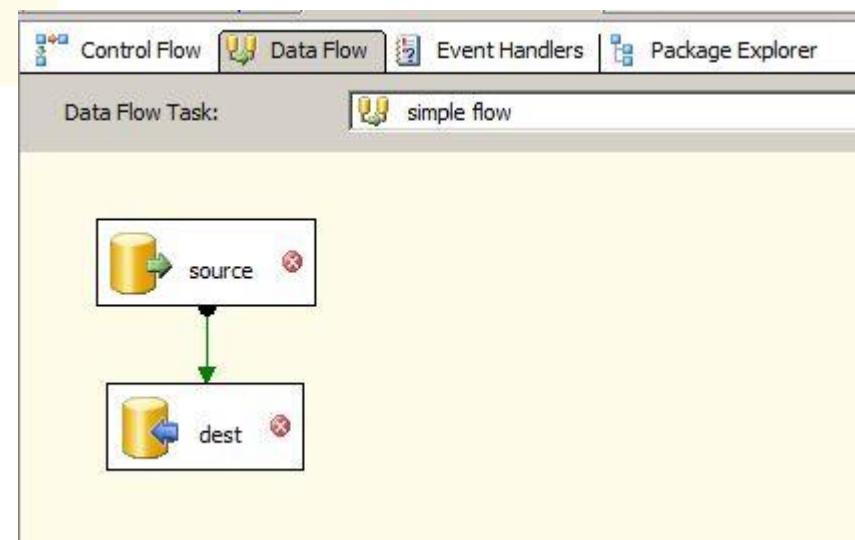
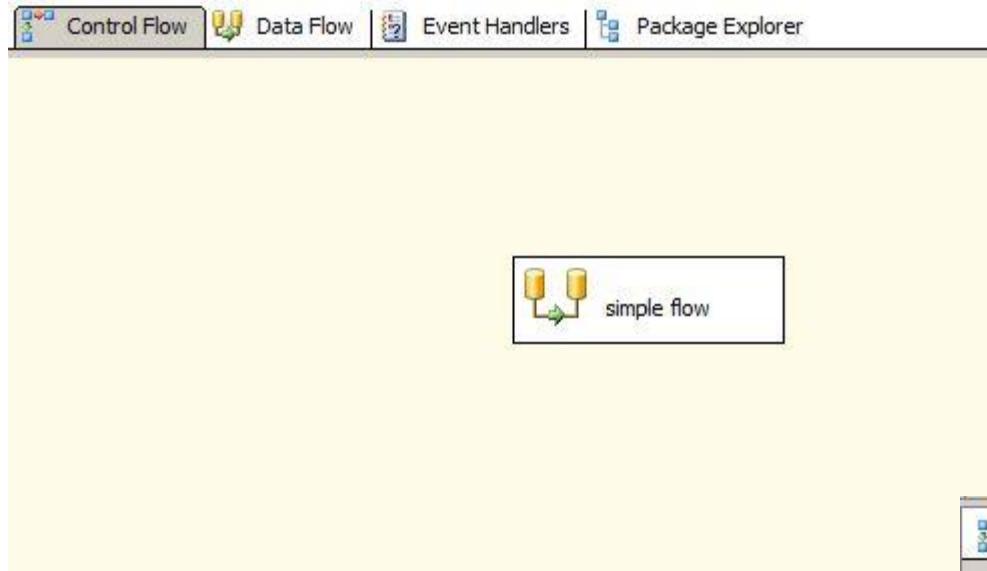
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**Hamster DB**  
embedded database



# SSIS package XML



# Informatica PowerCenter XML



In Informatica PowerCenter Designer - [Mapping Designer - SANDBOX\_KNP - [DEV\_PowerCenterRepositoryService]]

Repository Edit View Tools Layout Versioning Mappings Transformation Window Help

SANDBOX\_KNP - [DEV\_PowerCenterRepositoryService] SQ XML APP MQ AMG

Mapping Designer

Repositories

- DEV\_PowerCenterRepositoryService
  - CODEGEN\_TEST
  - DM
  - DSA
  - DSA\_HIST
  - EDW
  - SANDBOX\_JAR
  - SANDBOX\_KJE
  - SANDBOX\_KNP**
    - Business Components
    - Sources
    - Targets
    - Cubes
    - Dimensions
    - Transformations
    - Mapplets
    - Mappings**
      - knp\_dim\_test
      - knp\_performance\_10\_cols
      - knp\_perf\_lookup
    - User-Defined Functions
  - SANDBOX\_PBH
  - SANDBOX\_PHA
- PowercenterRepositoryService
- UDV\_PowerCenterRepositoryService

knp\_dim\_test

Mapping Designer

knp\_performance\_test\_dim\_1 (Microsoft SQL Server) Source Definition

K.	Name	Datatype	Length/Precision
	id	int	10
	business_key	varchar	30
	description	varchar	100

SQ\_knp\_performance\_test\_dim\_1 Source Qualifier

Name	Datatype	Length/Precision
id	integer	10
business_key	string	30
description	string	100

knp\_performance\_test\_dim\_11 (Microsoft SQL Server) Target Definition

K.	Name	Datatype	Length/Precision
	id	int	10
	business_key	varchar	30
	description	varchar	100

A diagram illustrating a data mapping process. It shows three tables: 'Source Definition', 'Source Qualifier', and 'Target Definition'. The 'Source Definition' table contains columns 'id' (int, 10), 'business\_key' (varchar, 30), and 'description' (varchar, 100). The 'Source Qualifier' table contains columns 'id' (integer, 10), 'business\_key' (string, 30), and 'description' (string, 100). The 'Target Definition' table contains columns 'id' (int, 10), 'business\_key' (varchar, 30), and 'description' (varchar, 100). Blue arrows indicate the flow of data from the Source Definition to the Source Qualifier, and from the Source Qualifier to the Target Definition.



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# part·ition (pär-tshn)*n.*

- 1.a.** The act or process of *dividing something into parts*.
- b.** The *state of being so divided*.
- 2.a.** Something that divides or separates,  
as a wall dividing one room or cubicle from another.
- b.** A wall, septum, or other separating membrane in an organism.
- 3.** A part or section into which something has been divided.

...

- 
- MCM videos
    - Sqllskills.com



# Partitioning as a design pattern

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*Dividing something into parts*

- Files
- Database
- Table

*State of being so divided*

- Informatica PowerCenter (ETL vs. Customer)
- Developers vs (evil?) DBA's
- Backups (what is a full backup anyway)

# *Dividing something into parts - files*

- Xml, csv, xls, fixed format
- 1 file
  - 1 or more tables
  - Data from 1 or more municipality
- 30 different file naming schemes

```
<?xml version="1.0"?>
<quiz>
<question>
Who was the forty-second
president of the U.S.A.?
</question>
<answer>
William Jefferson Clinton
</answer>
<!-- Note: We need to add
more questions later. -->
</quiz>
```

XML

first_name	last_name	sex	locale	profile_u_pic_big	affiliation	affiliation	affiliation	profile_upc	affiliation	wall_count
Tyrone	Roussell	male	en_US	http://www.http://pr/Yale Univ college	Alumnus	2011-01-22	2006	595		
Ted	Fronk	male	en_US	http://www.http://pr/New Havn college	Undergra	2011-02-09	2011	492		
Roslyn	Hettmann	female	en_US	http://www.http://pr/Princeton Universit		2011-01-27		1576		
Clare	Gostomski	female	en_US	http://www.http://pr/Princeton college	Alumnus	2011-01-30	0	686		
Jessie	Mahnke	female	en_US	http://www.http://pr/Stanford college	Alumnus	2011-02-15	2008	1926		
Lonnie	Pinales	male	en_US	http://www.http://pr/Stanford, college	Undergra	2011-01-18	0			
Carlene	Voorhies	female	en_US	http://www.http://pr/Columbia Universit		2011-01-06		1656		
Kurt	Metayer	male	en_P	http://www.http://pr/New York college	Undergra	2010-10-04	2009	317		
Maricela	Seel	female	en_US	http://www.http://pr/Massachus college	Undergra	2010-09-29	2010	159		
Erik	Gunnels	female	en_US	http://www.http://pr/Cambridge college	Alumnus	2011-02-05	2009	2194		
Darren	Thrall	female	en_US	http://www.http://pr/Brown Un college	Alumnus	2011-02-10	2007	2477		
Earnestina	Pruden	female	en_US	http://www.http://pr/Providen college	Alumnus	2011-02-04	2007	1562		
Dona	Petros	female	en_GB	http://www.http://pr/Dartmouth College		2011-02-09		2396		
Alejandra	Ram	female	en_US	http://www.http://pr/Hanover, college	Undergra	2011-01-27	2009	2678		
Karina	Foard	female	en_US	http://www.http://pr/Universit college	Grad Stud	2011-02-15	2009	3079		
Katherine	Bergquist	female	en_US	http://www.http://pr/Philadelphia, PA		2011-01-14		130		
Ericka	Nitta	male	en_US	http://www.http://pr/California college	Undergra	2011-01-03	2009	1110		
Jamie	Nealey	female	en_US	http://www.http://pr/Pasadena college	Grad Stud	2011-02-15	0	1763		
Hugh	Wakemar	female	en_US	http://www.http://pr/Washingt college	Undergra	2011-02-17	2009	861		
Clayton	Steuck	male	en_US	http://www.http://pr/Saint Loui college	Undergra	2011-02-01	2009	338		
Lorraine	Girton	female	en_US	http://www.http://pr/Georgeto college	Undergra	2011-02-17	0	2634		
Althea	Seager	female	en_US	http://www.http://pr/Washingt college	Undergra	2011-02-12	2013	1011		
Tanisha	Hannum	female	en_US	http://www.http://pr/Cornell U college	Grad Stud	2011-02-15	0	2285		
Rae	Boos	female	en_US	http://www.http://pr/Ithaca, NY college		2011-02-05	0	564		
Odessa	Gerardo	male	en_US	http://www.http://pr/Duke University		2011-02-08		3357		
Nelson	Balls	en_US	http://www.http://pr/Durham, NC			2011-01-23		126		
Ted	Allsup	female	en_US	http://www.http://pr/University of Califo		2011-01-01		858		
Kurt	Creelius	female	en_US	http://www.http://pr/Berkeley, work	Undergra	2011-02-14	0	803		

# *Dividing something into parts - files*

---

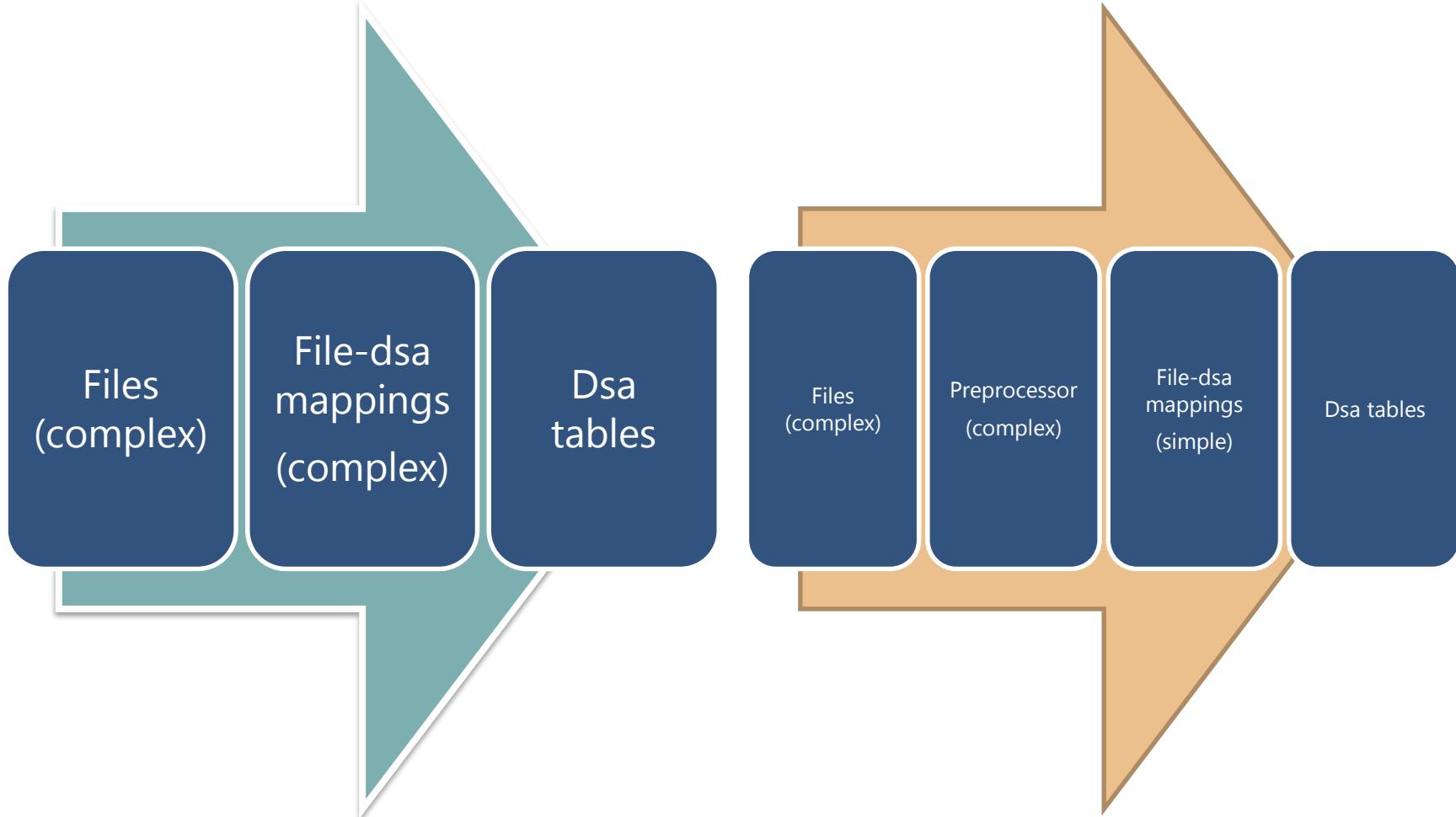


- Csv
- 1 file
  - 1 tables
  - Data from just 1 municipality
- 1 file naming scheme



# *Dividing something into parts - files*

---

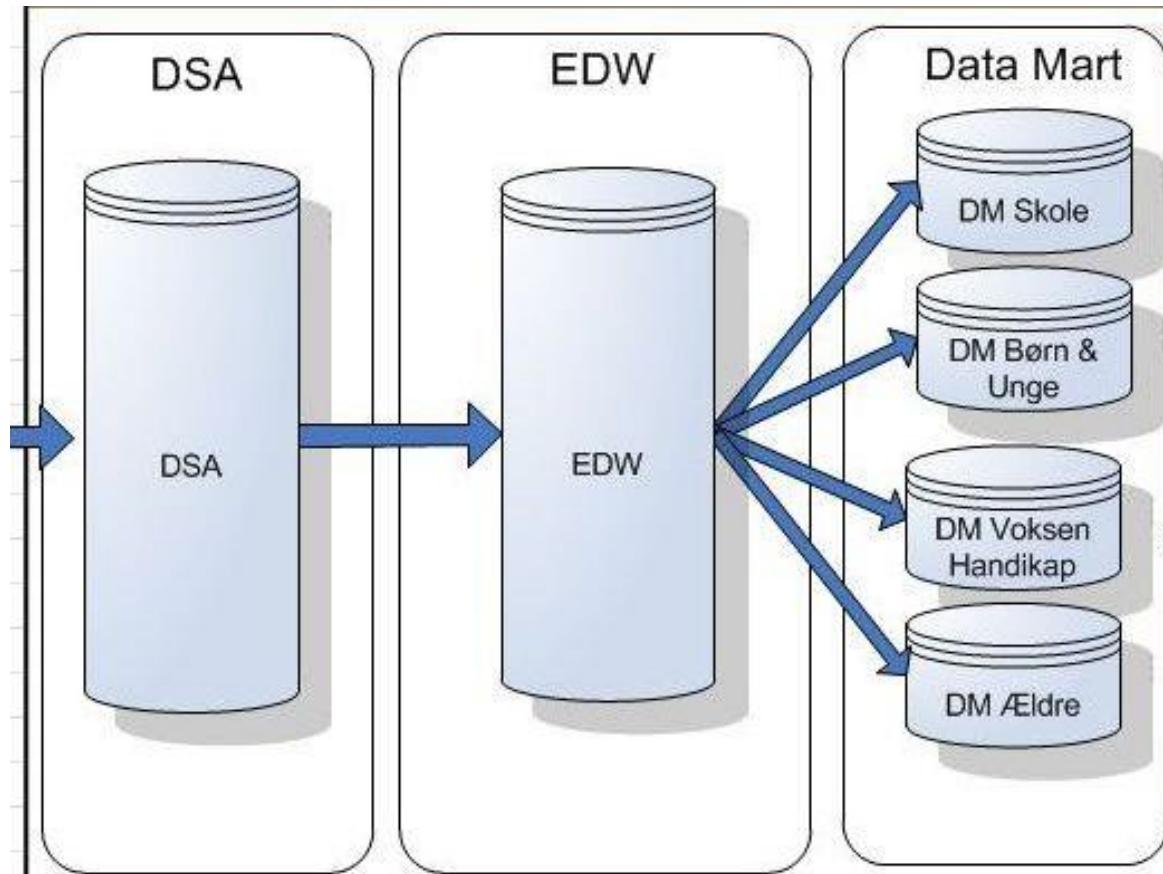


# *Dividing something into parts - Database*



1 data warehouse layer = 1 database

- Scaling
- IO-pattern  
for a data flow



# *Dividing something into parts - Tables*

---



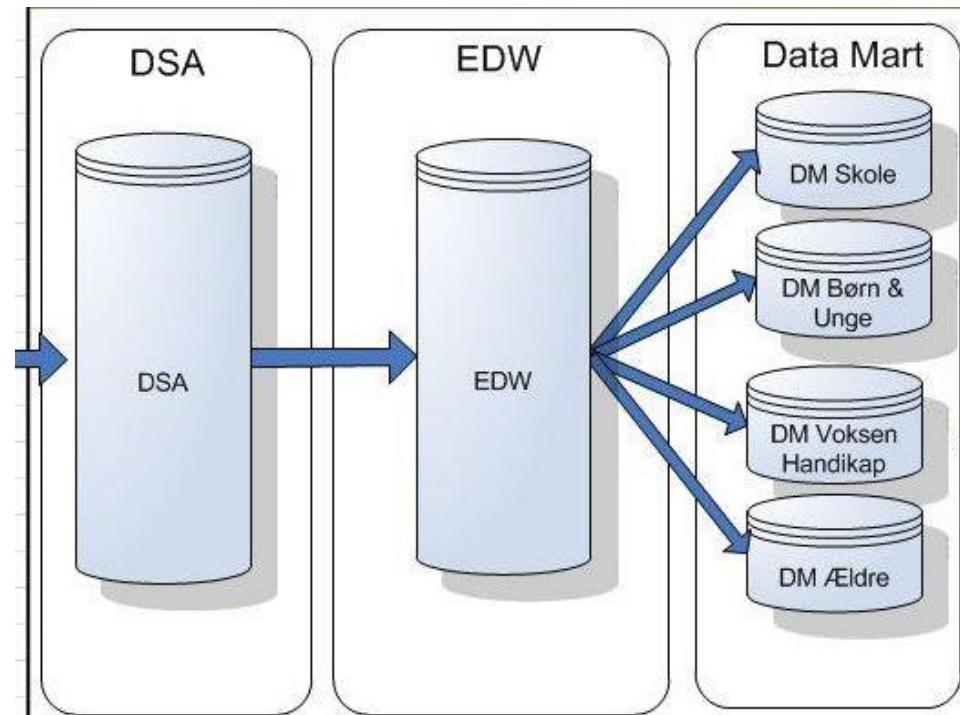
Table partitioning (2005 EE feature)

- Pruning
  - Divide the data warehouse into 100 parts 1/100 the size
- Switching
  - Separation of readers and writers
  - Fast

# *Dividing something into parts - Tables*



- DSA
  - Partition by municipality\_id, month\_year
- EDW and data marts
  - Partition by municipality\_id





# BUSTED

You know what you did.

# Ask Kristian!

---



```
CREATE TABLE [dbo].[partition_test] (
    [Kommune_id] [varchar](11)
NULL,
    [Kommunenummer]
[nvarchar](4000) NULL,
    [Distrikt_kode]
[nvarchar](4000) NULL,
    [Distrikt_type]
[nvarchar](4000) NULL,
    [Distrikt_tekst]
[nvarchar](4000) NULL,
    [Cpr_Dist_Tekst_TS]
[nvarchar](4000) NULL
) ON [partition_test_pt_sc]([Kommune_id])
GO
```



# *Dividing something into parts –* CPU's

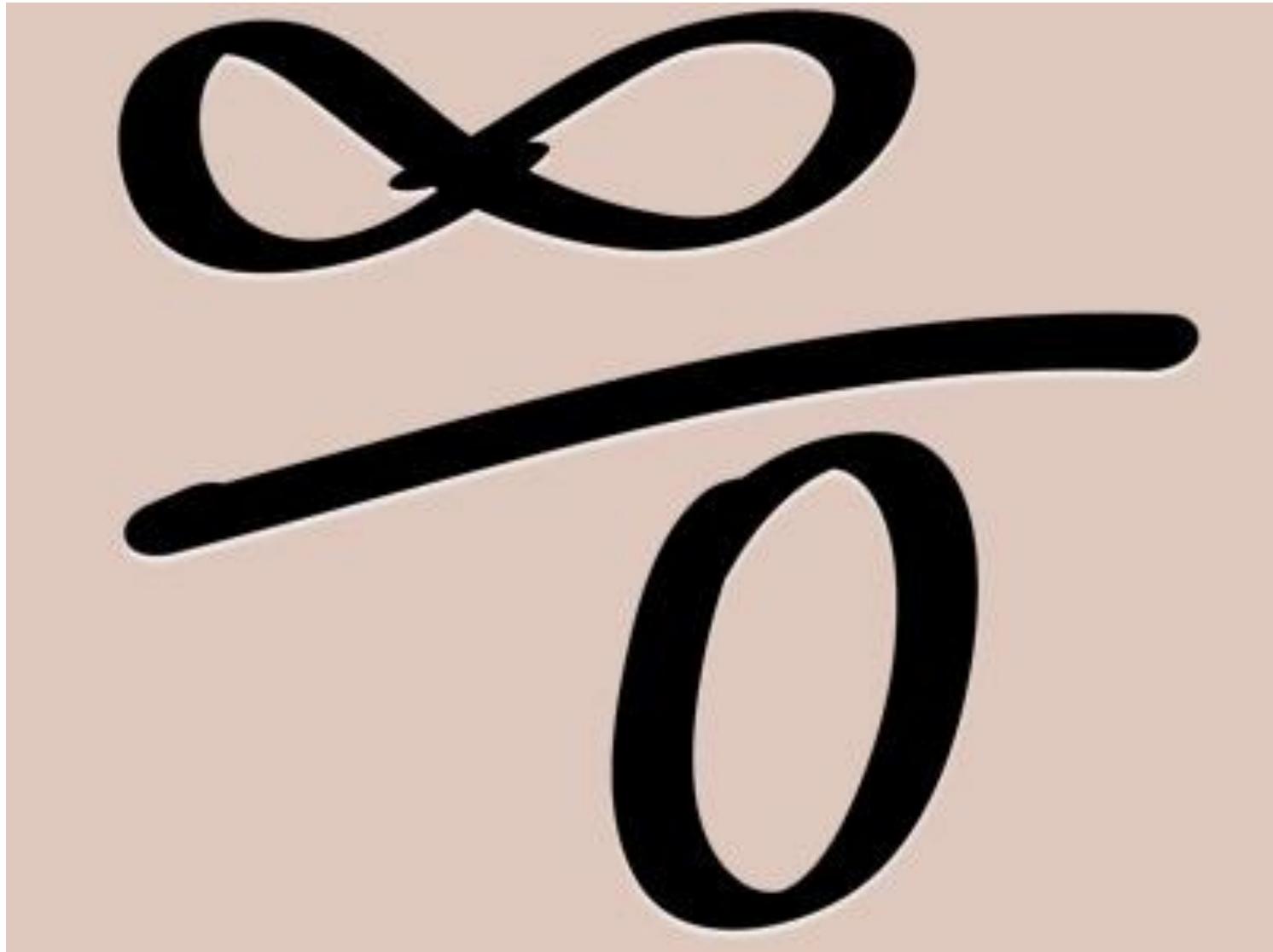


Processor	Processor Affinity	I/O Affinity
NumaNode0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CPU0	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CPU1	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU2	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU3	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU4	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU5	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU6	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU7	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU8	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU9	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU10	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU11	<input checked="" type="checkbox"/>	<input type="checkbox"/>
NumaNode1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CPU12	<input type="checkbox"/>	<input checked="" type="checkbox"/>
CPU13	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU14	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU15	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU16	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU17	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU18	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU19	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU20	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU21	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU22	<input checked="" type="checkbox"/>	<input type="checkbox"/>
CPU23	<input checked="" type="checkbox"/>	<input type="checkbox"/>

- Affinity masking
- Not really possible in Oracle – even on Windows

*State of being so divided*

---



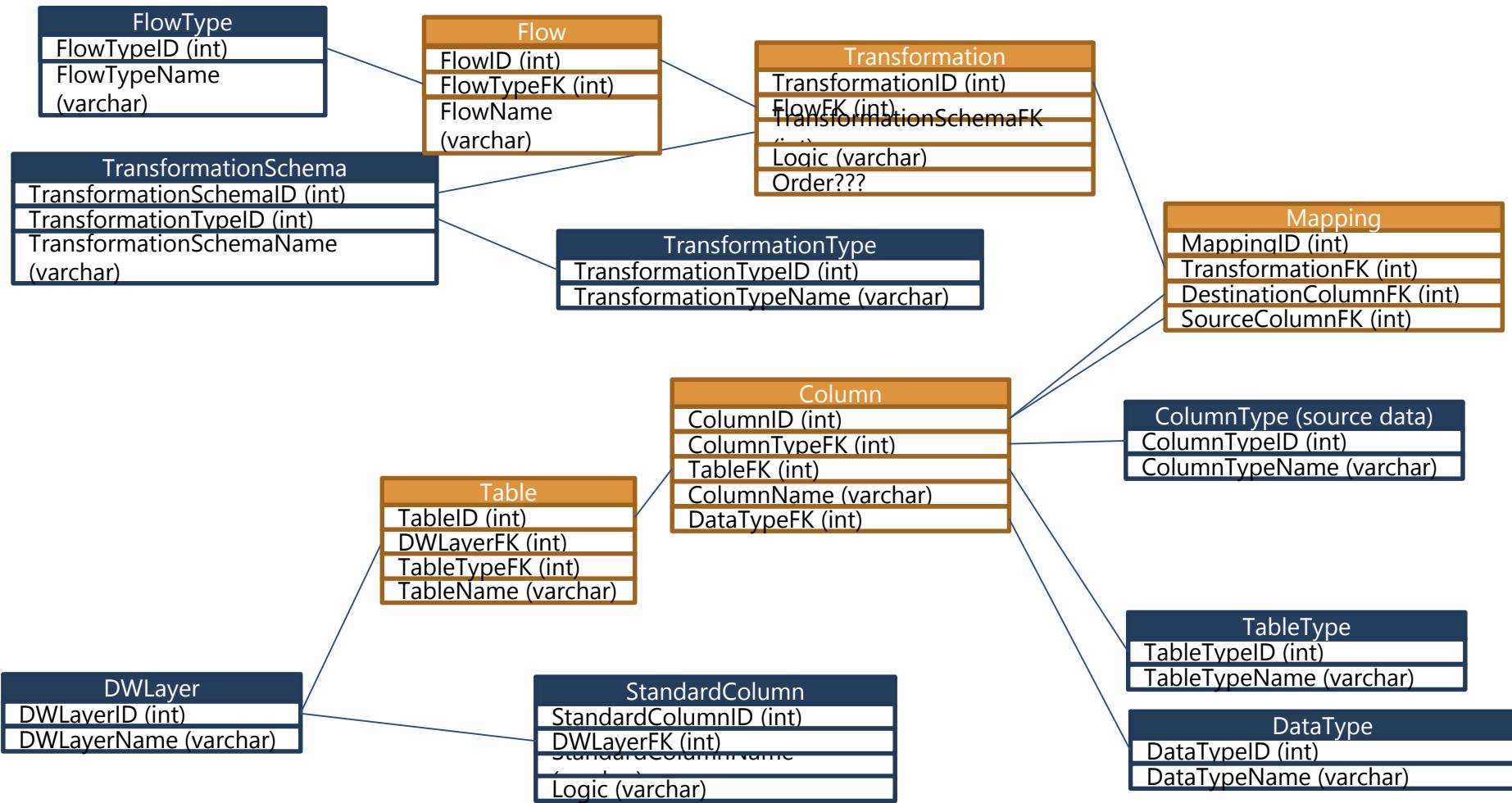
# *State of being so divided*

---



- Informatica PowerCenter (ETL vs. Customer)
- Meta data
  - File definitions
  - Table definitions in all layers
  - Simple transformations
- Autogenerate mapping code from meta data

# Mapping metadata model



# *State of being so divided*



## Developers vs. (evil) DBA's

- Meta data on table definitions
  - Script ddl from meta data
  - Hide partitioning in ddl
- Partition Scheme
  - Change File group design

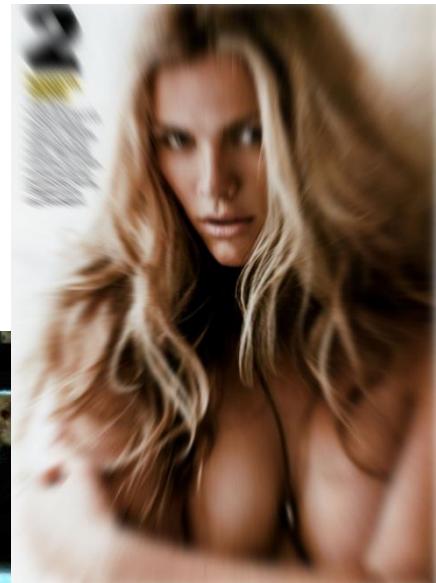


# *State of being so divided*

---



- Backups: DBA's vs. Backup administrator
- Partitioning helps us divide data into
  - Hot
  - (C)old (and therefore read only)
- Only backup hot partitions



# *State of being so divided*

---



- Restoring: DBA vs. SQL server ☹
- PRIMARY filegroup
  - 100 MB
- Default filegroup
  - Big
- Restore database
  - only primary filegroup  
=> online



# *State of being so divided*

---



- DW vs OLTP and OLAP
- DW server
  - ETL
  - processing OLAP databases/cubes
- Reporting server
  - Sharepoint databases (OLTP)
  - restoring OLAP databases/cubes

**BUT WAIT,**  
**there's more!**



# We also use these cool features...

---



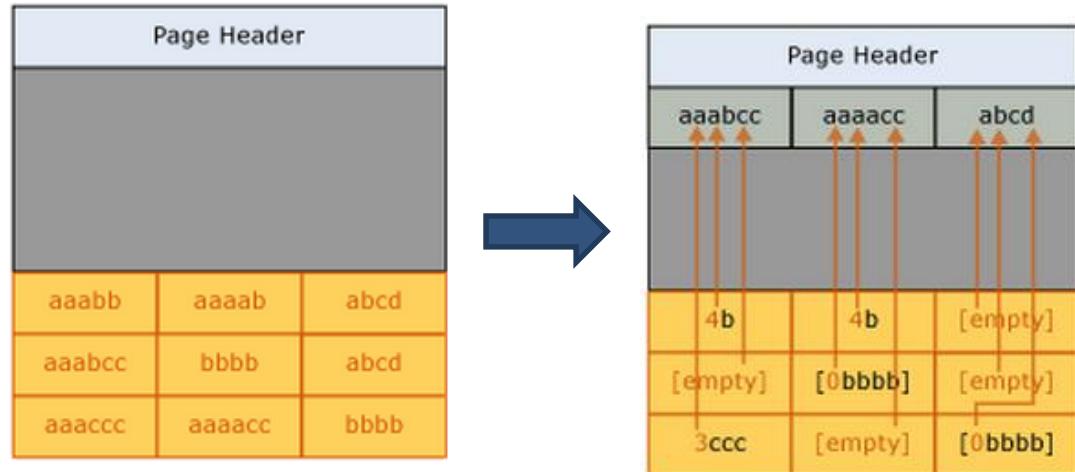
- Page compression
- Backup compression



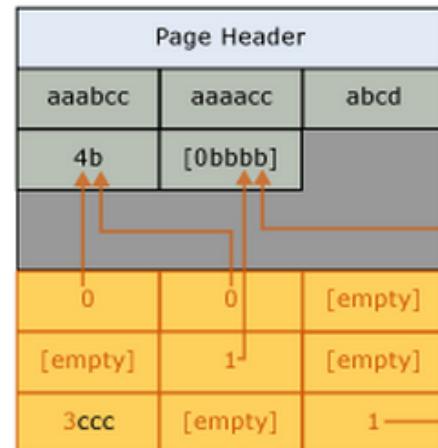
# Page compression 101



- Row compression
- Prefix compression



- Dictionary compression



# Page compression results

---



```
code      vartype  varval
DA000    DGALT    00K00
DA000    DGCAT    06M38A
DA000    DGPROP   26X01
DA001    DGALT    00K00
DA001    DGCAT    06M38A
DA001    DGPROP   26X01
DA009    DGALT    00K00
DA009    DGCAT    06M38A
DA009    DGPROP   26X01
```

table	Factor (size)	Num rows	cpu time <b>num reads (ms)</b>	elapsed time (ms)
dg1	1	89132	<b>372</b>	<b>31</b>
dg1	2	178264	<b>743</b>	<b>31</b>
dg1	10	891320	<b>3781</b>	<b>281</b>
dg1_page_compr	1	89132	<b>143</b>	<b>15</b>
dg1_page_compr	2	178264	<b>285</b>	<b>62</b>
dg1_page_compr	10	891320	<b>1427</b>	<b>421</b>



or

