

# DHIS2 as Health Insurance MIS OpenHIMIS Initiative





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# Part 1:From MS IMIS to OpenHIMISPart 2:NHIF Kenya DHIS2 DWH



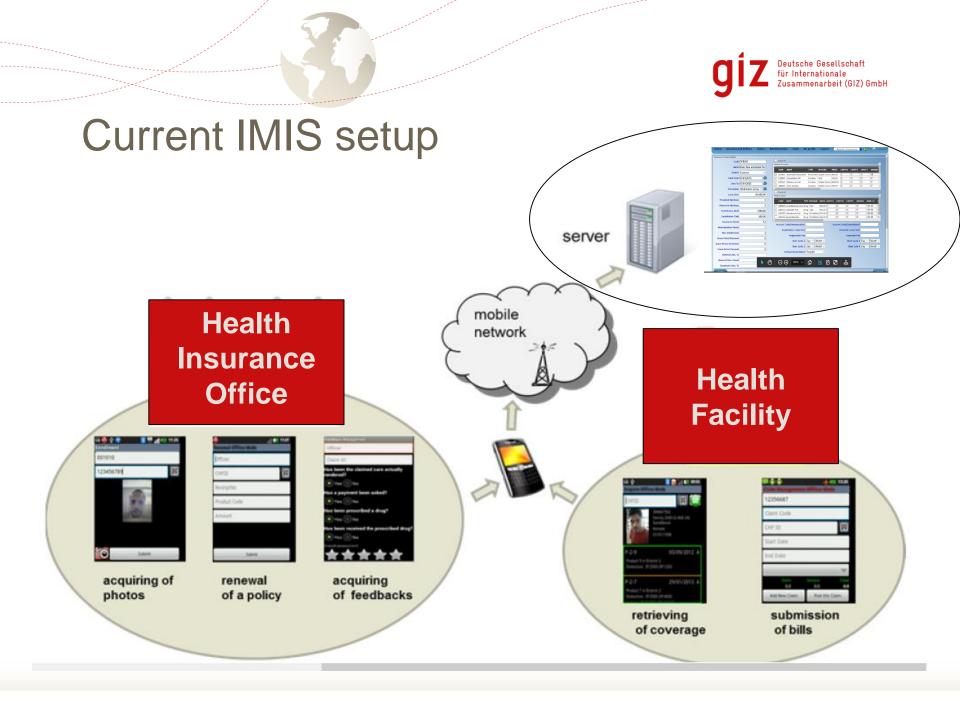
# Current status of IMIS

#### **Collaborative effort of**

- Swiss Agency for Development and Cooperation (SDC)
- German Development Cooperation (GIZ)

#### **Current status**

- Started in 2011, developed by SwissTPH
- Used in Nepal, Tanzania, Cameroon
- Licence owned by SDC
- Covers most important health insurance functions: Members Management, Policy Management, Claiming, Claims processing, Payments to Facilities





# Policy definitions

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## Claims selection and processing

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# From "IMIS" => "OpenHIMIS"

- 1. It should be built using **open source** technology in a community driven process
- 2. It should be **scalable** to support also larger countries
- **3. Modularity and interoperability:** Be able to communicate with other systems through clearly defined APIs (OpenHIE)
- **4. Data standards**: Adhering to data standards prepares also for future interoperability scenarios (HL7 FHIR), incl. **data security**
- 5. It should re-use components of **existing standard software**/platform solutions, to benefit from technical, functional and community synergies. Embed solution into national health system architectures
- 6. Support to existing **users** and implementations (Tanzania, Nepal, Cameroun)
- 7. Reduce cost, time and complexity of software **implementation**



# **Opportunities for DHIS2**

- MS IMIS: No other international standard solution (commercial or open source) directed at health insurance in low income countries
- No UHC icon in the OpenHIE map (!)
- Health Insurance schemes often have best health demographics data
- Health Insurance often **disconnected** from MoH
  - Often different ministry
  - Reluctant to share finance related data
- Opportunities
  - Joint reporting, joint indicators
  - Client registry / health demographics

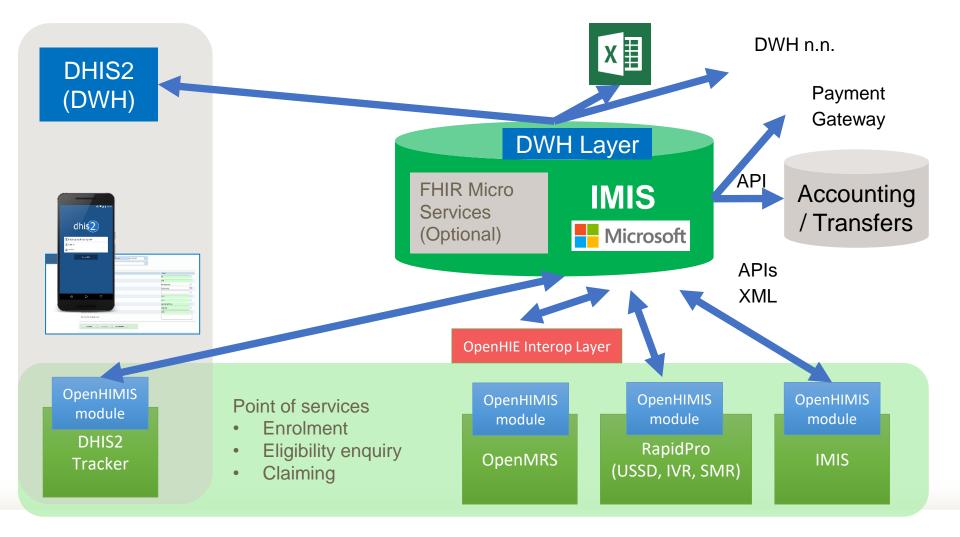


## Resource sharing opportunities

DHIS2 community activities	Opportunities for OpenHIMIS
Training	
Academies: >1000 Participants /	Special Training Module, Special
year	Academies
Online Training Course	Use existing Learning Management
	System
Certification	OpenHIMIS Implementer Certificate
User Support	
Community	Joint support for DHIS2 Health
4th level support	Insurance modules
Implementers	
Guides	Integration guides
Conferences: > 300 participants/	Participate, Pre-Conference, DHIS2-
year	OpenHIMIS



#### First ideas on system architecture







# Part 1: From MS IMIS to OpenHIMIS Part 2: NHIF Kenya DHIS2 DWH



## Contents

- **1.** The National Hospital Insurance Fund
- **2.** Business Intelligence in a Nutshell
- **3.** Modelling Business Intelligence Needs at the NHIF
- 4. Technical Implementation of the BI Prototype with DHIS2
- 5. Discussion





#### **1.** The National Hospital Insurance Fund

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## Background Information of NHIF - Kenya

- founded1966 as department of Ministry of Health
- over 15 Mio beneficiaries
  - formal sector
  - informal sector
- over 1800 hospitals accredited
  - inpatient and outpatient
- 125 offices / 47 counties
- app. 1700 employees





#### Current Areas of Reporting at the NHIF

- membership registration and management
- claims processing and analysis
- revenue collection and debt management
- financial reporting (income and expenditure)
- budget and utilization of funds



## **Reporting Challenges Faced**

- Existing reporting infrastructure feeds directly from the ERP
- New reporting needs have to be implemented by IT developers.
- Several issues are compromising the performance, usability and quality of existing reports.
- It is difficult to produce timely and consistent reports for managerial processes and external communications.



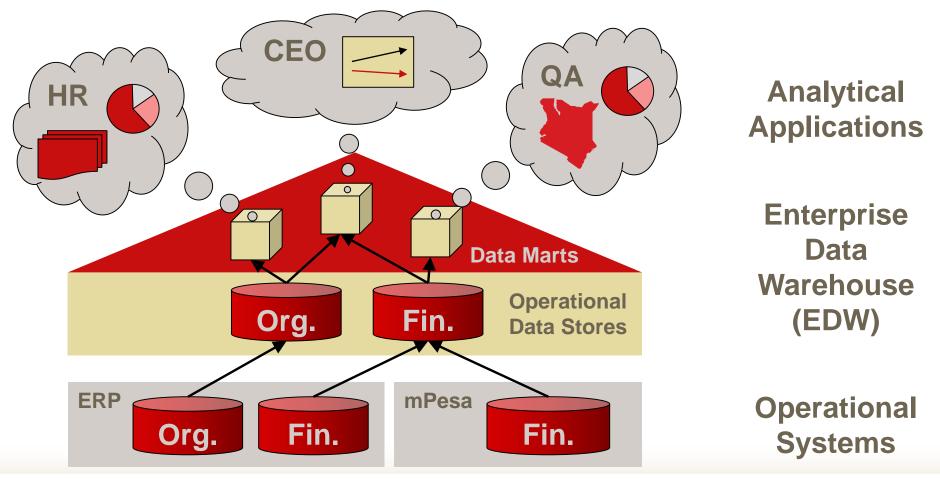


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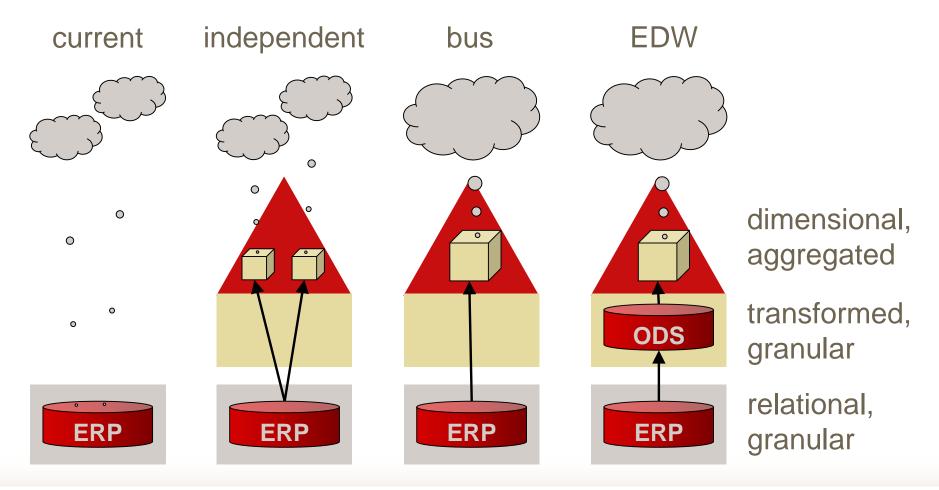
#### Typical Business Intelligence Architecture (Example)



P Ernst, U Wahser - DHIS2 for Health Insurance MIS



#### **Alternative Business Intelligence Architectures**



P Ernst, U Wahser - DHIS2 for Health Insurance MIS

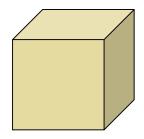
Dimensional data

Fact / Keyfigure: Revenue collected

#### Dimension 1: Time

Dimension 2: Sector

Revenue	2015	2014	2013	2012
Private Sector	45678	34567	23456	12345
Public Sector	4567	3456	2345	1234
Micro Insurance	456	345	234	123
Sponsored Prg.	45	34	23	12



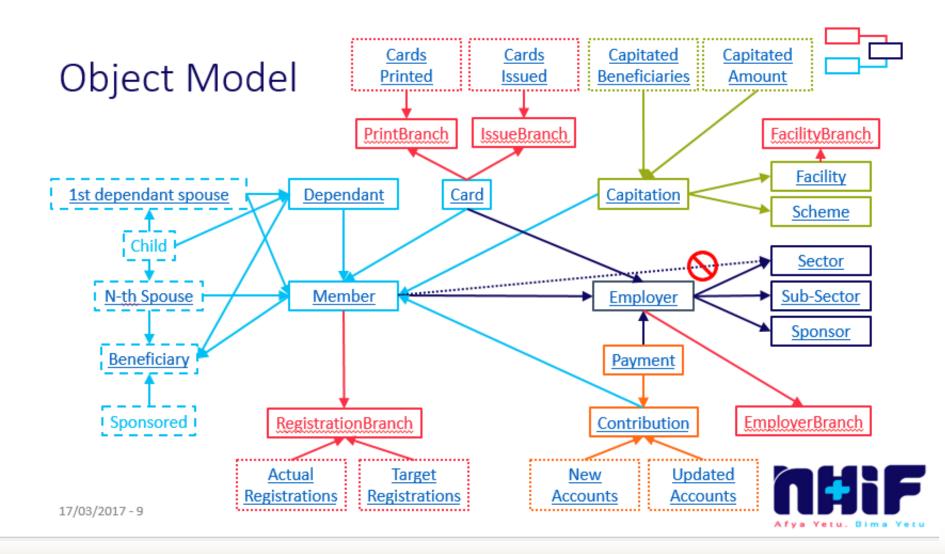






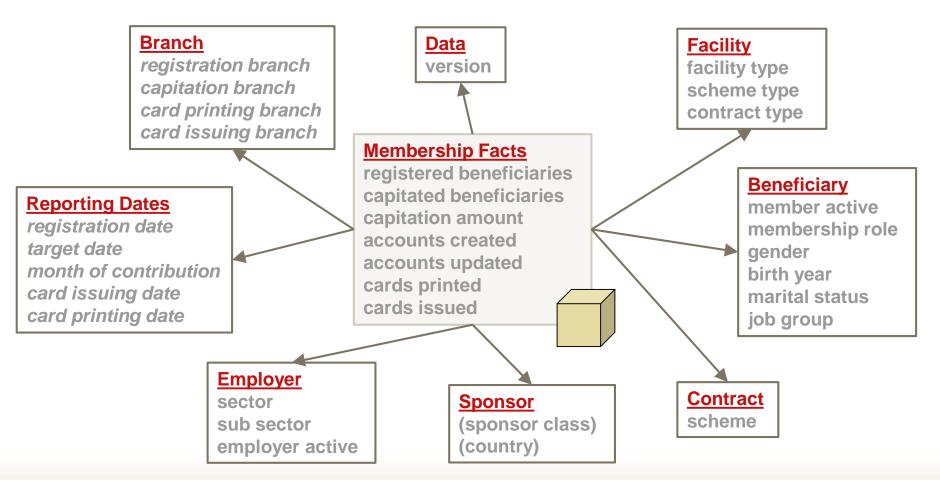
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#### Datamodel Membership (Facts & Dimensions)



P Ernst, U Wahser - DHIS2 for Health Insurance MIS

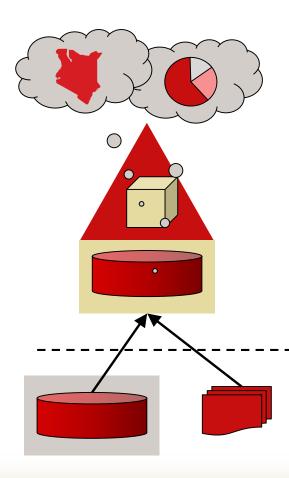




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#### Very Broad Architecture of DHIS2



analytical level (e.g. dashboards, GIS, pivot tables)

aggregate level ("data sets")

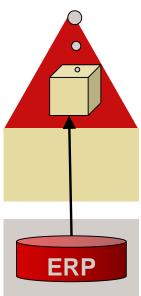
detailed level ("tracker")

- source systems (e.g. patient records)
- manual data entry (e.g. facility statistics)



#### Chosen Architecture for the NHIF Prototype



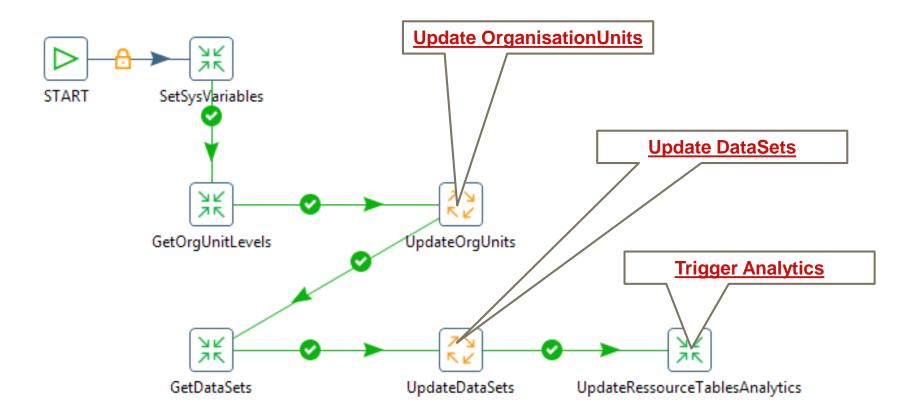


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Dimensions	Categories	
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Scheduling	Jobs	C A Hitachi Group Company
	Pentah	o Data Integration

Pentaho Data Integration ("Kettle")

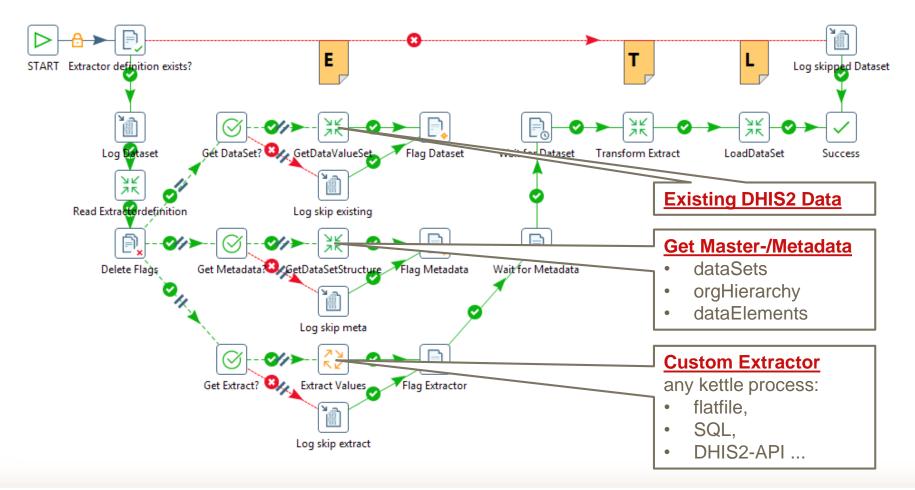


#### Generic ETL Process for DHIS2 using Kettle





#### Generic Dataset-Loader for DHIS2 using Kettle







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## Current Use of the DHIS2-BI-Platform

- Data on Membership implemented
  - Coming up: Claims, Employers, Targets
- Nightly updates of all data
- Data analysis mainly via pivot tables
  - Coming up: standard reports, dashboard for branches
- Further down the line: enable other ETL-targets, e.g. events, tracked level



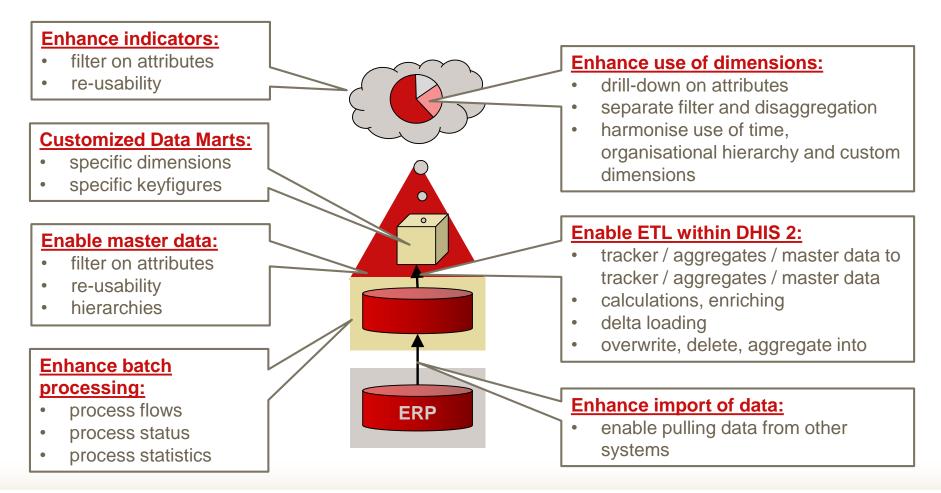
#### Prototype - and then?

#### **Results:**

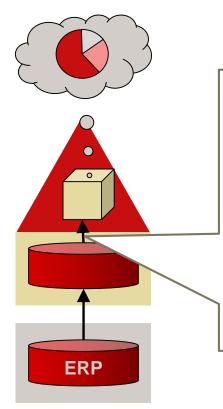
- estimation: more than 50% of the reporting needs can be covered
- BI self service possible
- single point of truth = consistent reporting possible
- timely reporting possible because of cube architecture
- architecture can be managed with local resources

<u>Question</u>: Will an additional investment of XXX.XXX KSH justify an increase of Y% covered reporting needs?





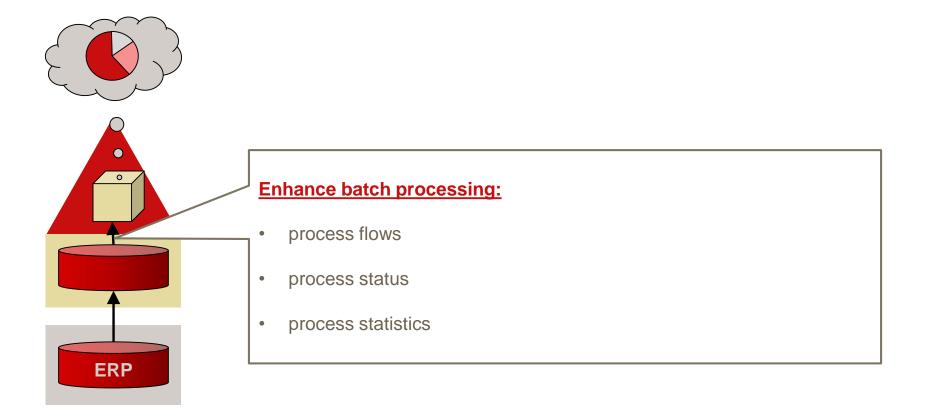




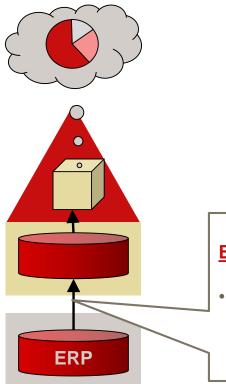
#### Enable ETL within DHIS 2:

- tracker / aggregates / master data to tracker / aggregates / master data
- calculations, enriching with master data
- delta loading (only what has changed since last load)
- overwrite, delete, aggregate values





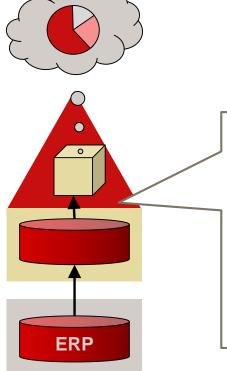




#### Enhance import of data:

- enable pulling data from other systems = give control to DHIS2
- currently data can only be pushed into DHIS2 from outside via API

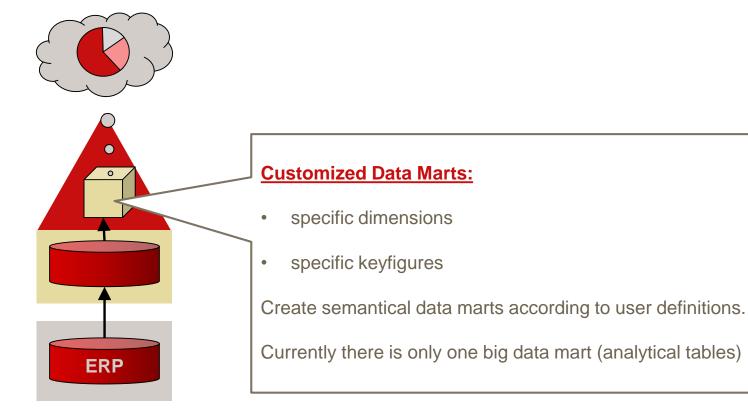




#### Enable master data beyond organizational hierarchy:

- filter and aggregate on attributes of master data (e.g attributes of benefit packages)
- re-usability (referring hospital vs. care giving hospital)
- other hierarchies (e.g. product hierarchies, ICD10, )







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#### Enhance use of dimensions:

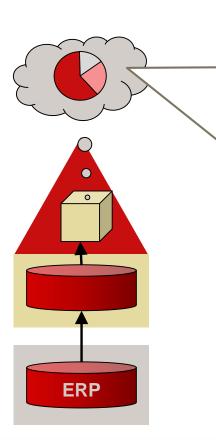
- drill-down on attributes of masterdata
- separate filter and disaggregation
- harmonise use of time, organisational hierarchy and custom dimensions

**ERP** 

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#### **Enhance indicators:**

filter on attributes:

Data Element: beneficiaries Attribute: gender ['M','F']

Female Beneficiaries = beneficiaries WHERE { gender = 'F' }

• re-usability:

Percentage of Female Benficiaries = Female Beneficiaries / Beneficiaries \* 100