Understanding & Best Practices with the QVD File Format

We will begin at the top of the hour…

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Factory

Information Management Solutions

QlikLearn

Understanding & Best Practices with the QVD File Format

What?

Why?

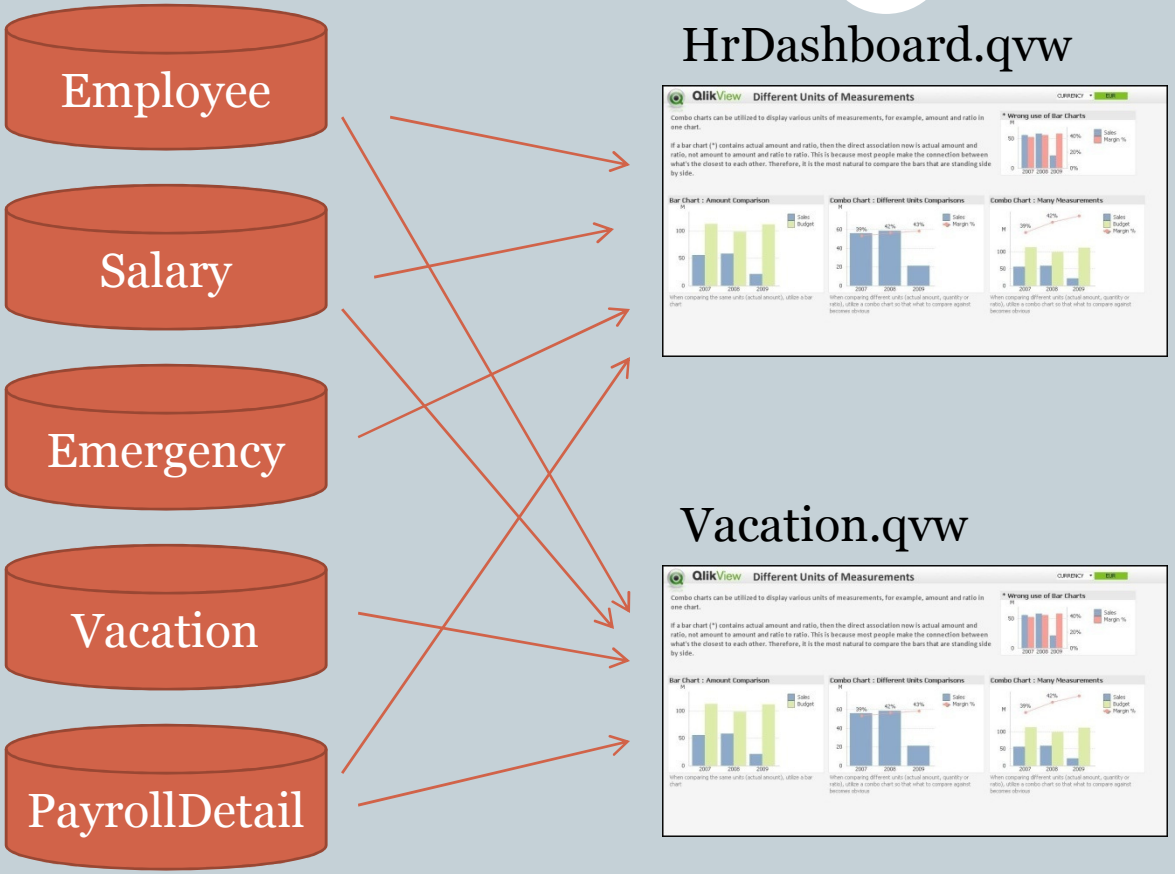
How?

Architectures

WHAT?

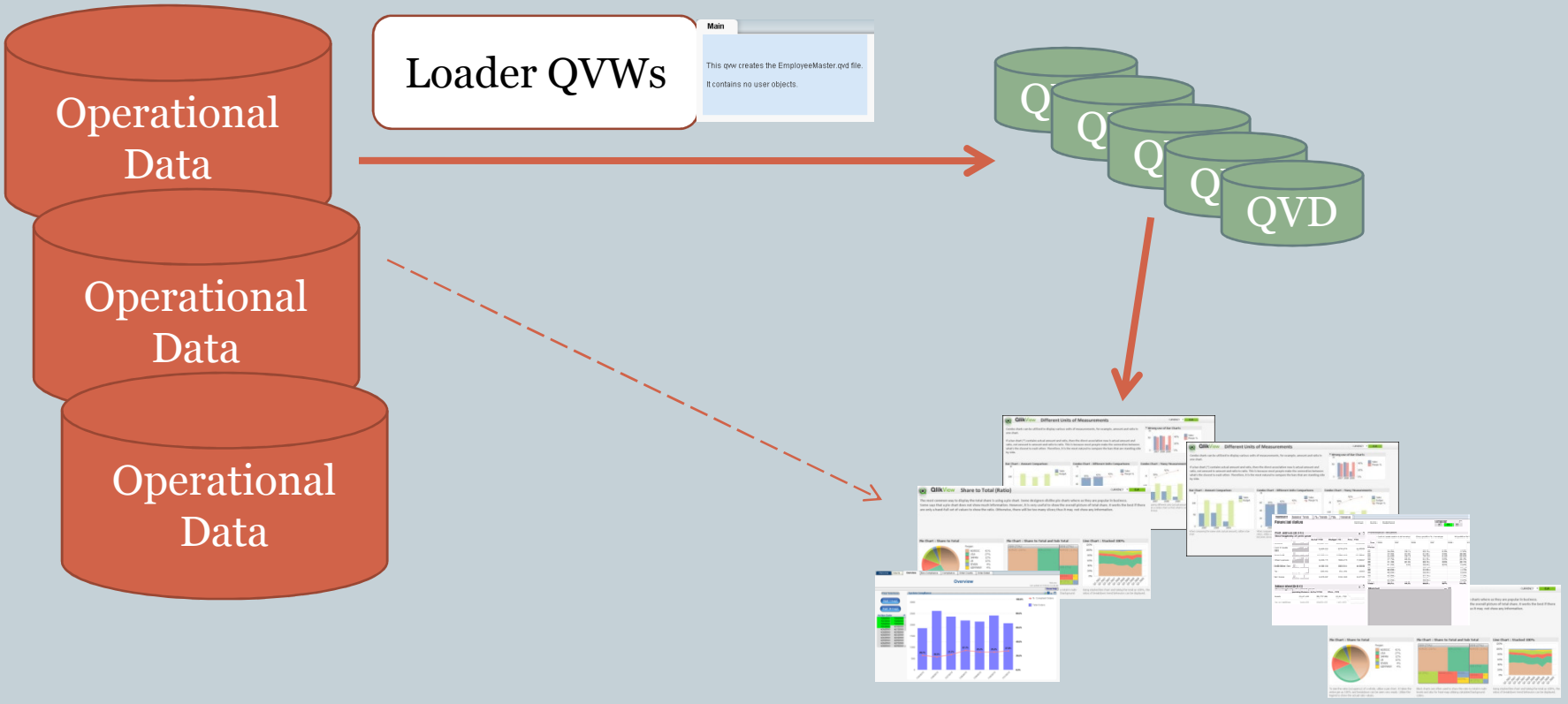
Basic "Single Tier" Model

Datasource



A *.qvw contains the ETL script, loaded data & screen objects.

Two-Tier Concept

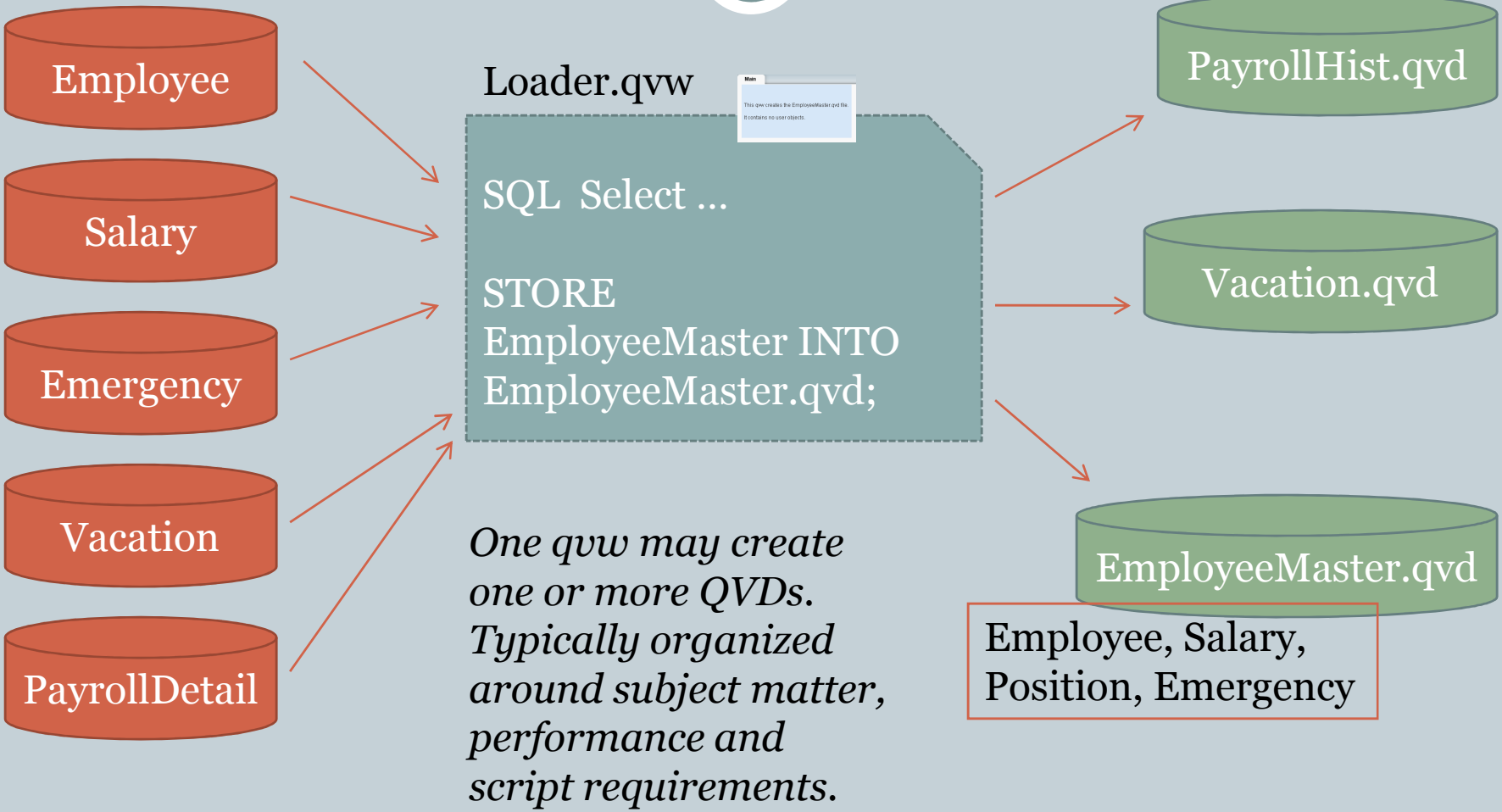


User facing qvws

QVDs

- **Q**lik**V**iew **D**ata file.
- One ***Qlikview*** table per *.qvd file.
- Loads very fast.
- Provides reusable “extract once” single version of ETL’ed data.
- May be used to provide history beyond current datamart.

Creating QVDs

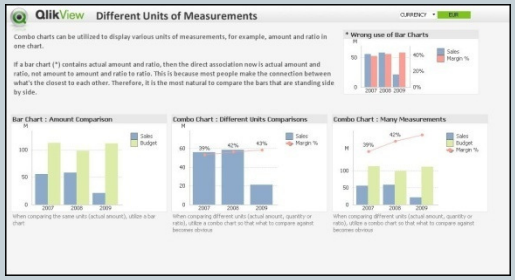


Consuming QVDs

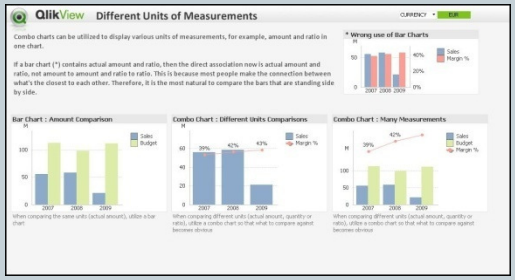
EmployeeMaster.qvd

Vacation.qvd

HrDashboard.qvw



Vacation.qvw



WHY?

QVD Benefits

- Loads fast
- Reduced DBMS load & improved scalability
- Ease of maintenance
- Separation of Roles
- De-normalization
- Incremental Load
- Data consistency, SVT
- QVD Data Dictionary

Loads Fast!

- Typically 10 to 100 times faster than loading from DBMS.

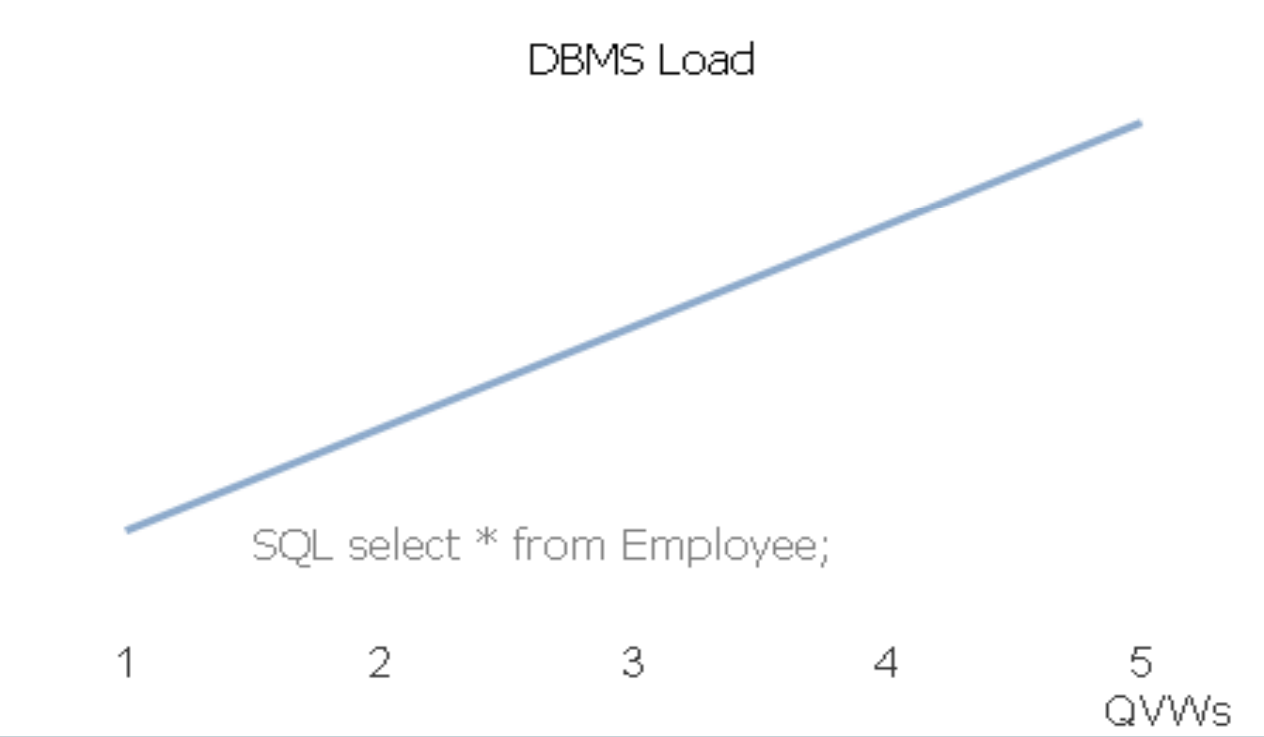
DBMS – 20 minutes

QVD – 30 seconds!

- Throughput is based on a number of factors including number of fields, network configuration and hard disk speed.

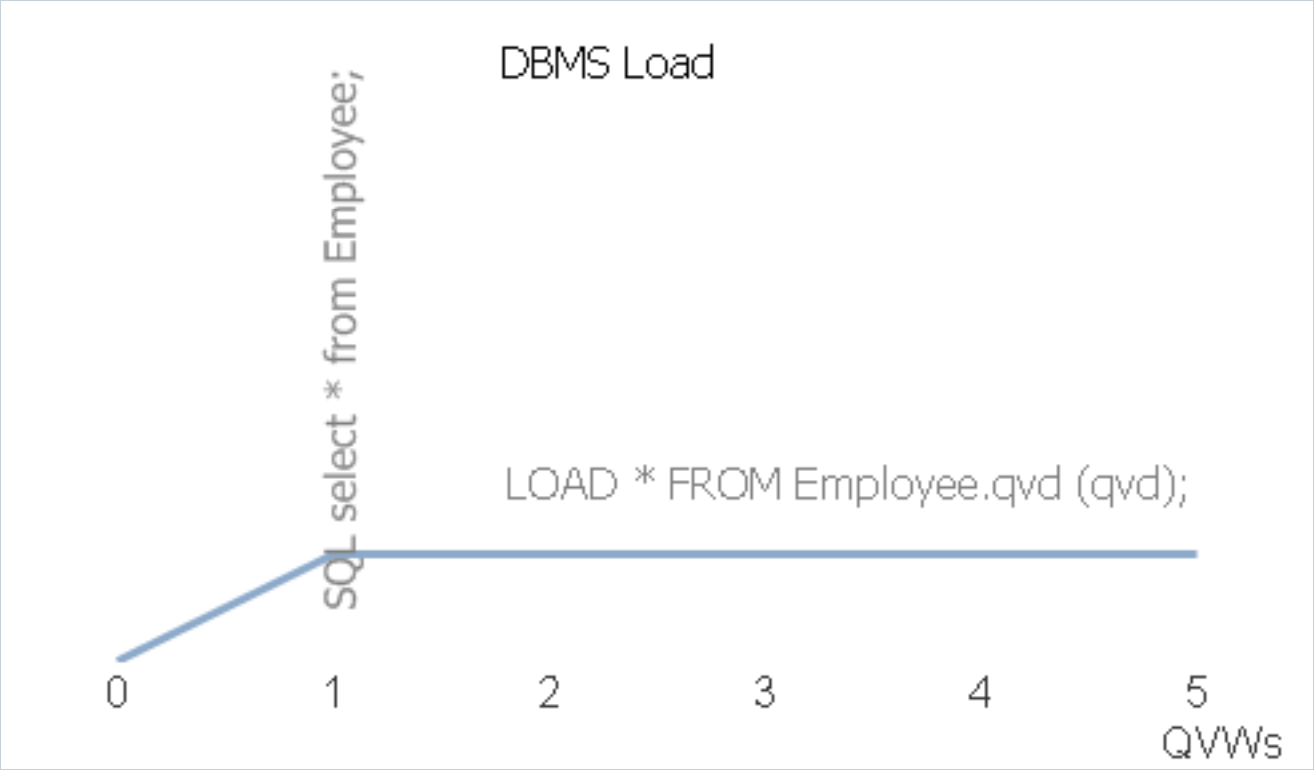
Reduced DBMS Load & Improved Scalability

- Every QVW repeats the SQL Select…



Reduced DBMS Load & Improved Scalability

- Or…one SQL Select, then load from QVD



Ease of Maintenance – Redundant Scripting –

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- A new business rule….

  Change all occurrences of CostCenter "3502" to"3501".

- Revenue.qvw

```
// Remap CostCenter 3502
if(CostCenter='3502', '3501', CostCenter) as CostCenter
```

- Sales.qvw

```
// Remap CostCenter 3502
if(CostCenter='3502', '3501', CostCenter) as CostCenter
```

- Commission.qvw

```
// Remap CostCenter 3502
if(CostCenter='3502', '3501', CostCenter) as CostCenter
```

Ease of Maintenance
– Eliminate Redundant Script –

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- LoaderCostCenter.qvw

```
// Remap CostCenter 3502
if(CostCenter='3502', '3501', CostCenter) as CostCenter

STORE CostCenterTable INTO CostCenter.qvd;
```

- Revenue.qvw

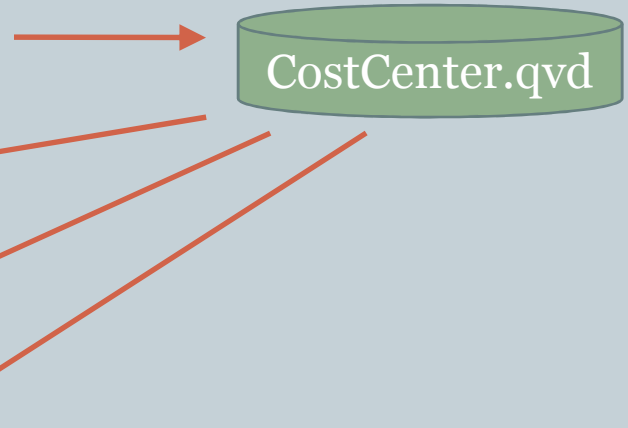
```
LOAD * FROM CostCenter.qvd (qvd);
```

- Sales.qvw

```
LOAD * FROM CostCenter.qvd (qvd);
```

- Commission.qvw

```
LOAD * FROM CostCenter.qvd (qvd);
```



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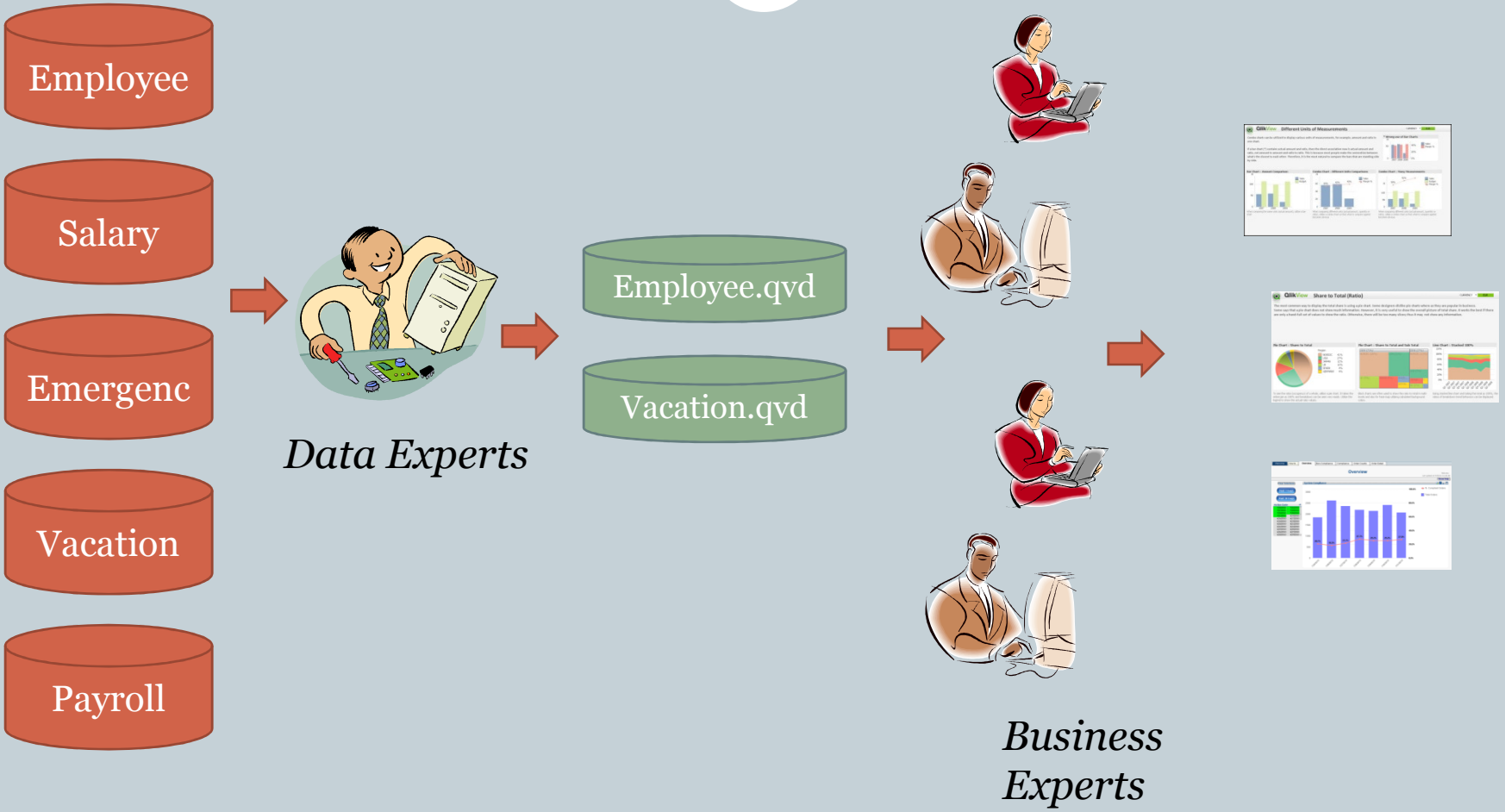
Separation of Roles



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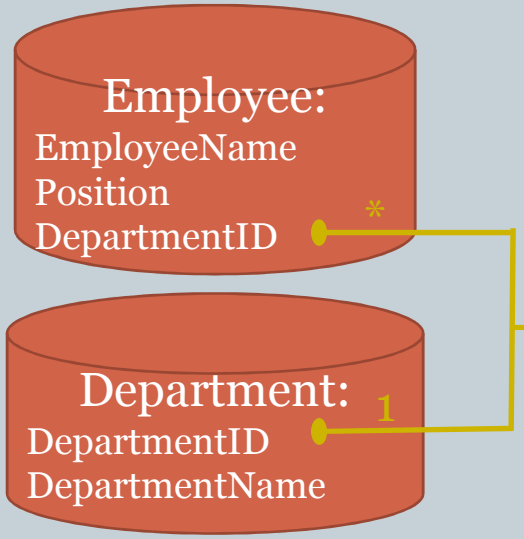
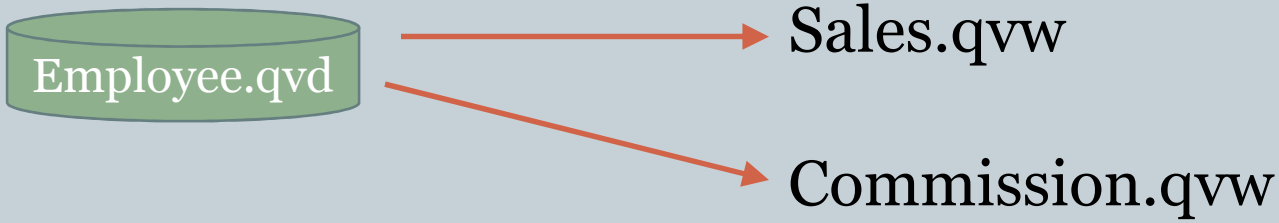
Denormalization




```
LEFT JOIN (Employee)
SQL SELECT DepartmentID,
DepartmentName
FROM dbo.Department ;
```

EmployeeName	DepartmentName
Alan Haight	Customer Service
Joe Boxer	Sales
Sally Smith	Sales

```
STORE Employee INTO Employee.qvd;
```



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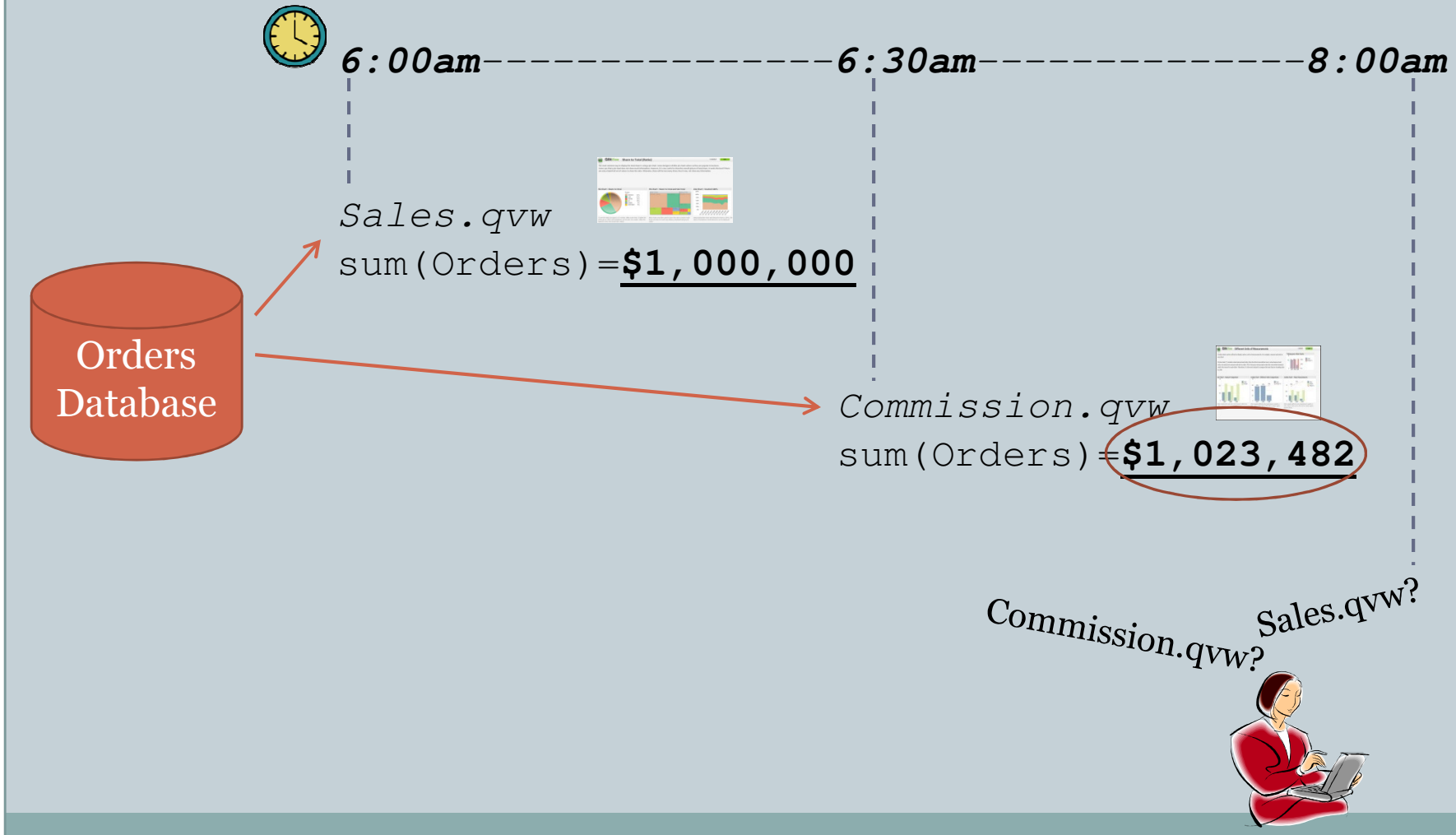
Data consistency, SVT



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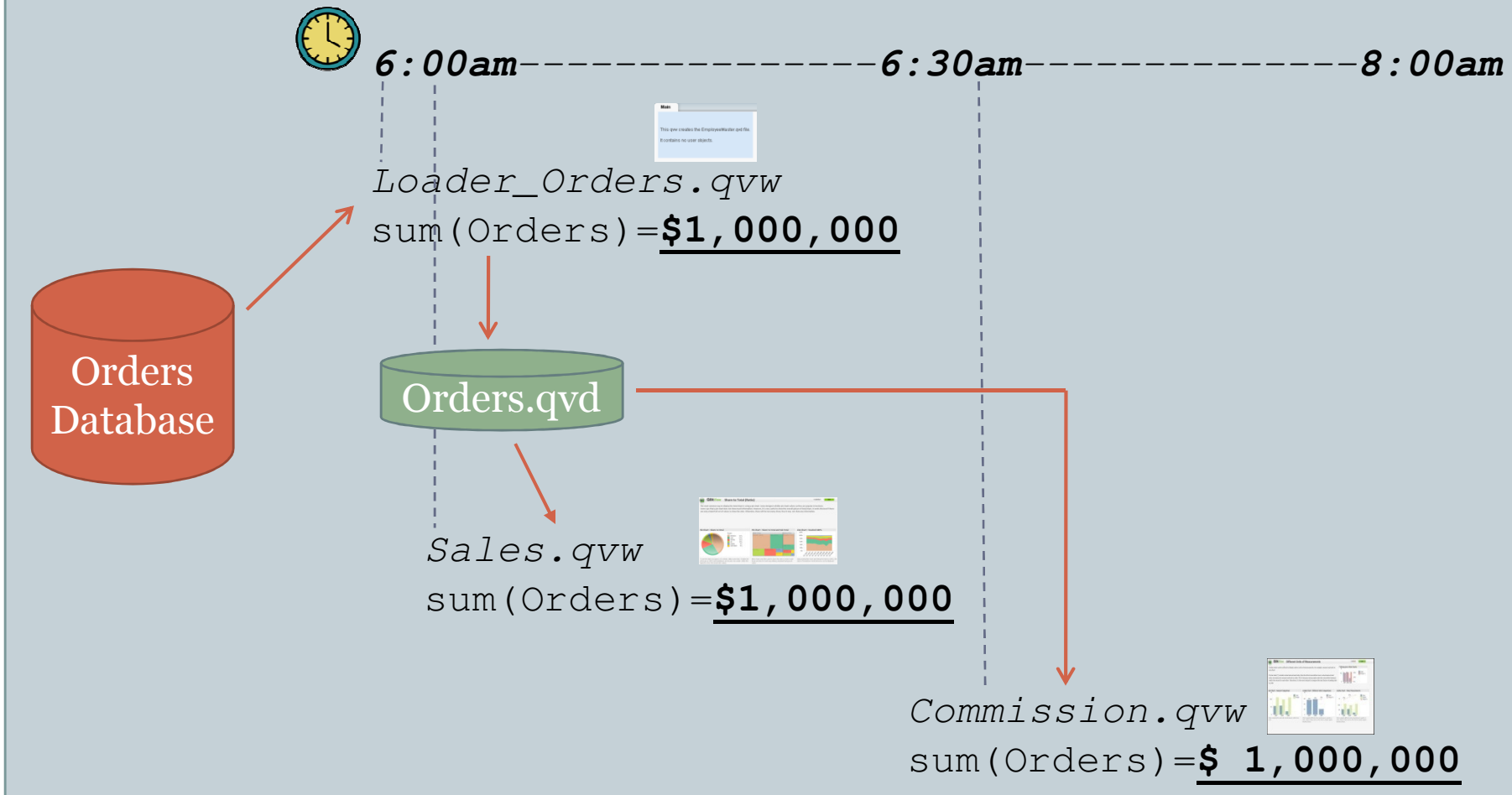
QVD Data consistency, SVT



Incremental Load

- Fetch only new or changed rows from DBMS
- New rows are merged with existing rows in QVD
- Greatly reduces load on DBMS

Full Table: 10M rows, 30 minutes

Changed data, 50k rows, 1 minute

- Reduced load time may enable intra-day reloads

History & Snapshots

- QVDs may be used to store data longer than DBMS
- Some applications may require periodic snapshots for auditing or delta reporting:
  - `Customers_2010_06.qvd`
  - `Customers_2010_07.qvd`

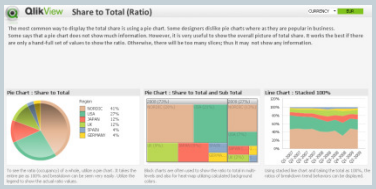
How?

Creating QVDs

- QVDs may be created in three ways:
  - Explicitly using STORE script statement
  - Implicitly using BUFFER script statement
  - Via UI chart Export

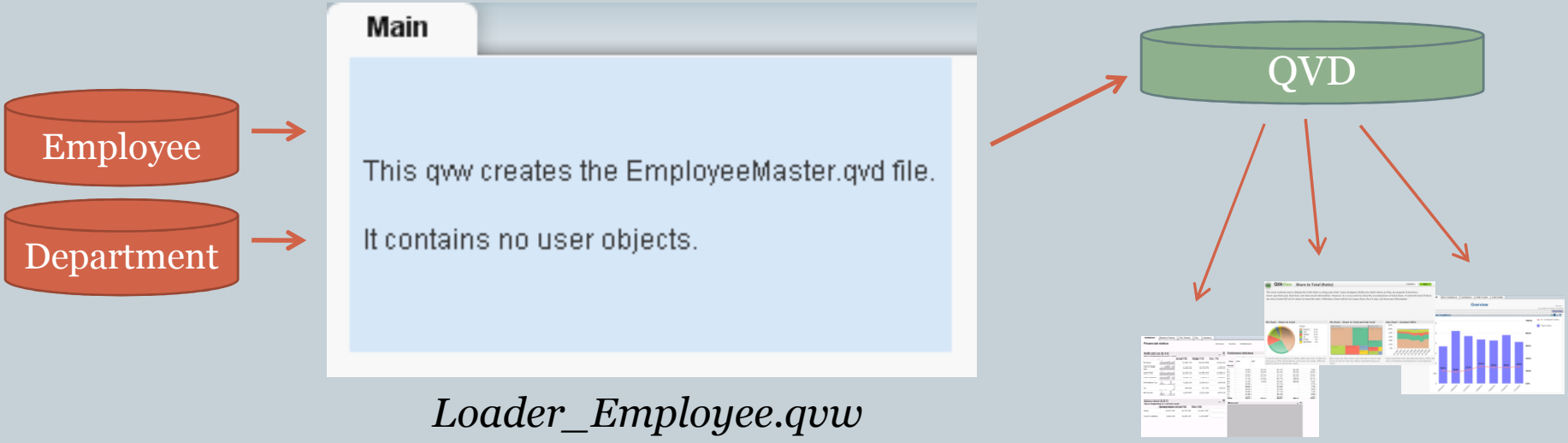
Creating QVD - STORE

- STORE may be done in script of user-facing qvw



HrDashboard.qvw

- More typically done in special purpose "Loader" qvw



Loader_Employee.qvw

STORE Syntax

- **STORE *table* INTO *filename*.qvd (qvd|txt);**
- Default is "(qvd)" – typically not specified
- "(txt)" creates a CSV file
- ***filename*** may include path – `data\employee.qvd;`
- ***filename*** respects Directory statement. e.g.

```
Directory data;
STORE Employee INTO employee.qvd;
```

Writes to **data\employee.qvd**

Creating QVD - BUFFER

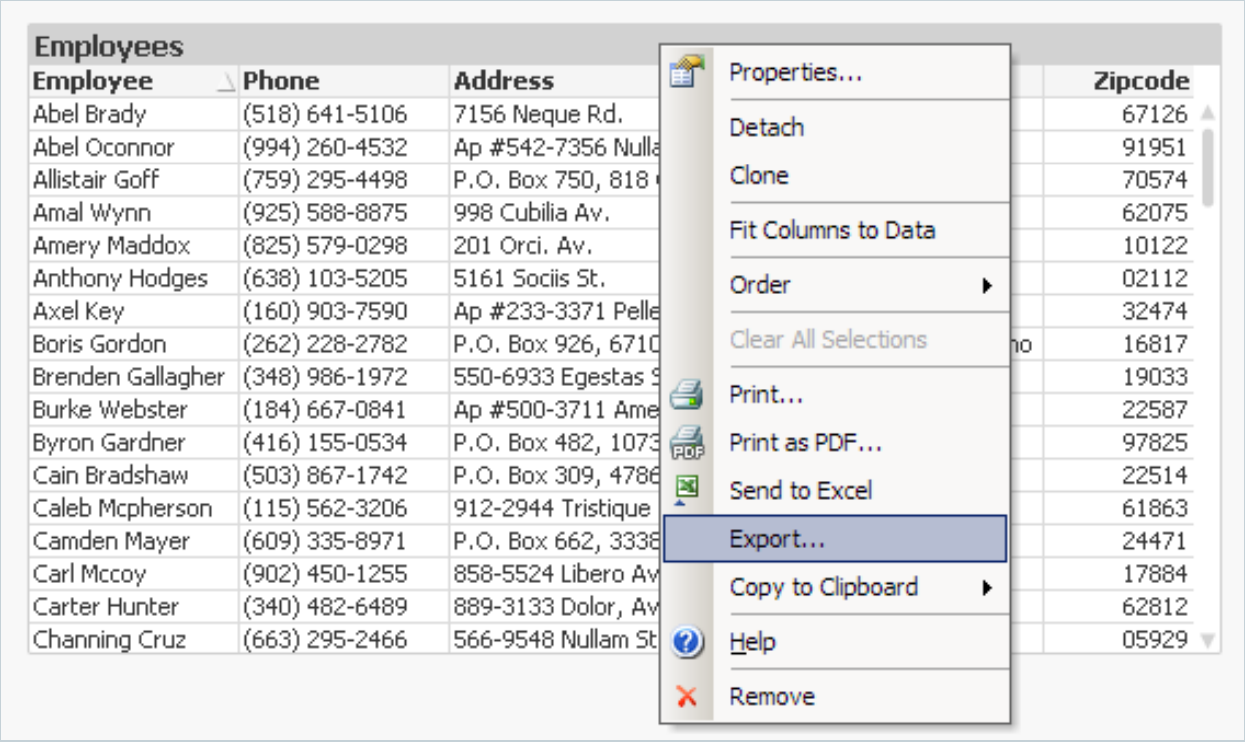
- BUFFER prefix on LOAD signifies that a QVD should be automatically created on first execution, and read from on subsequent executions.

```
BUFFER LOAD * FROM Access*.log;
```

- QVD is created in a special location. The QVD is automatically dropped and recreated if the LOAD statement changes.
- Very useful with text files (like logs) where incremental load is “automatic”.
- Less useful with DBMS tables, but often used to speed development.

Creating QVD – UI Export

- Charts (not TableBoxes) may be exported to QVD using context menu Export



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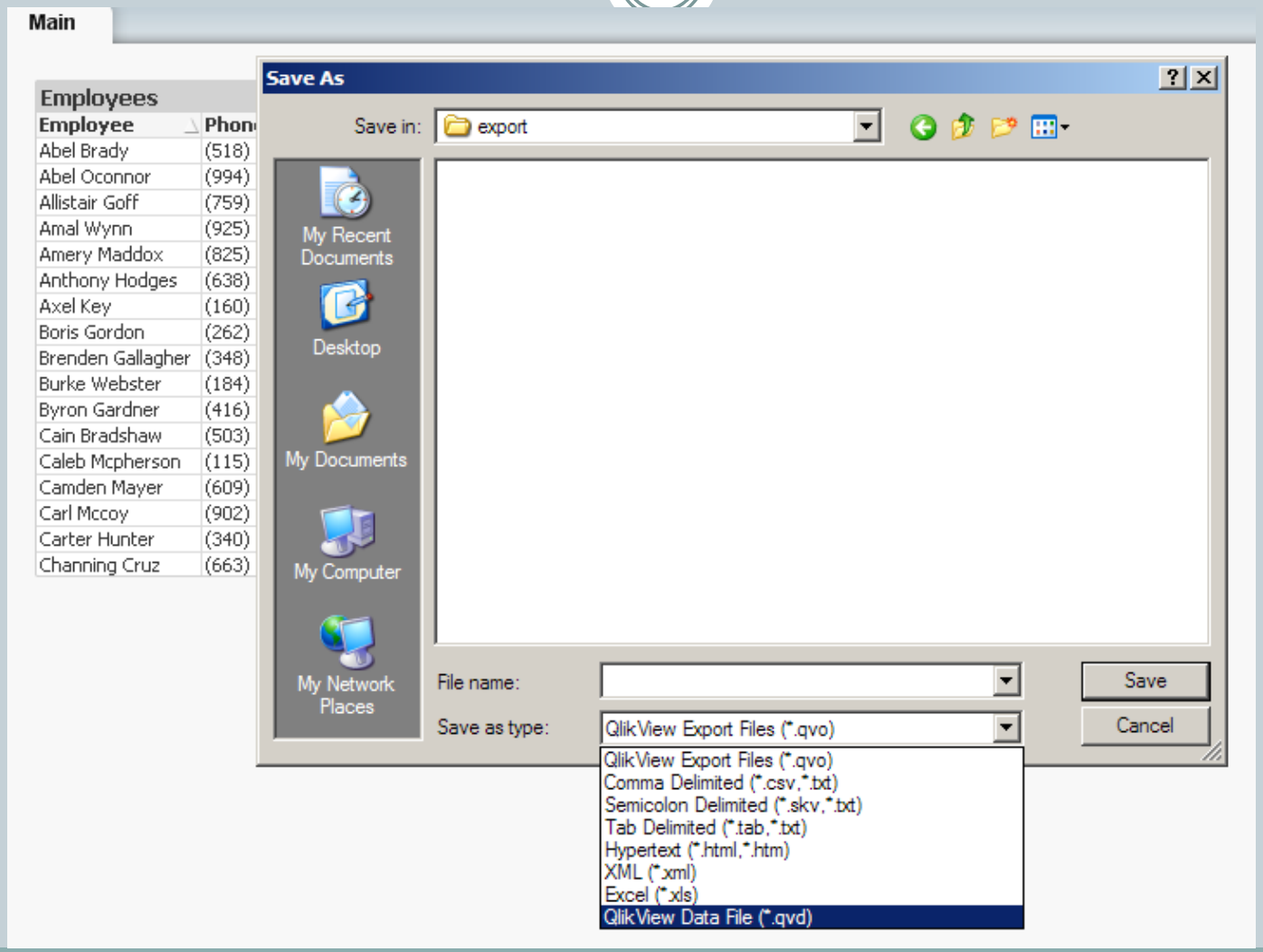
Creating QVD – UI Export

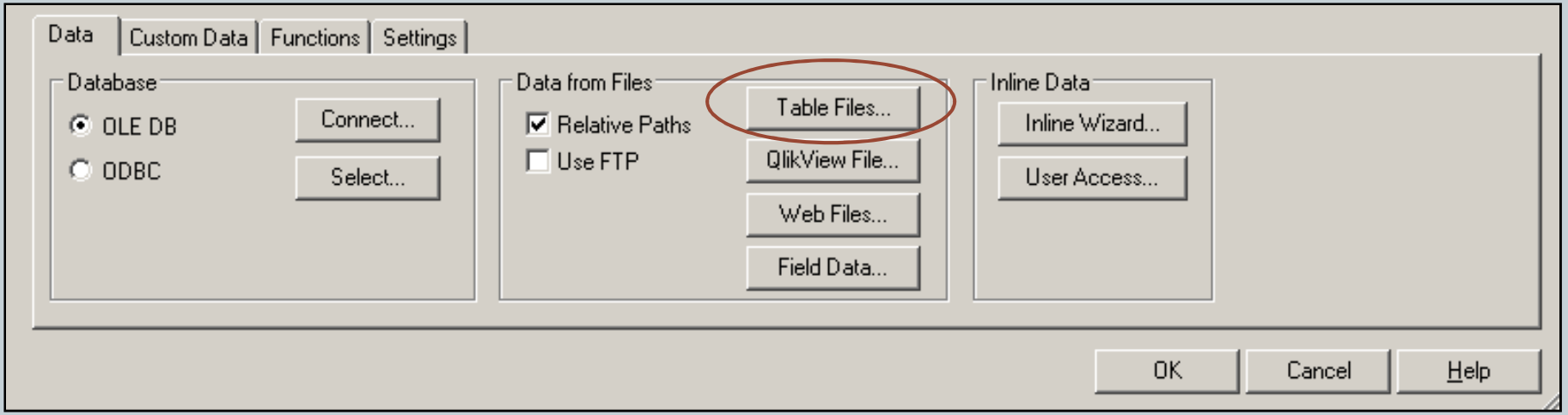


Loading QVDs

- QVDs may be loaded
  - Explicity – `LOAD * FROM data.qvd (qvd);`
  - Implictly – `BUFFER LOAD …`

Loading QVDs Explicit

- Script wizard support provided by Table Files button



Loading QVDs Explicit

- **LOAD *fieldlist* FROM filename.qvd (qvd);**
- **(qvd) parameter is critical. If ommitted, script error or unexpected (xml) data.**
- **filename** respects Directory statement. e.g.

```
Directory data;
LOAD * FROM Employee.qvd (qvd);
```

Reads from **data\employee.qvd**

Loading QVD - BUFFER

```
BUFFER LOAD * FROM Access*.log;
```

- Will load from QVD if it exists, otherwise will read FROM source.
- If source is text files, will read only new data.

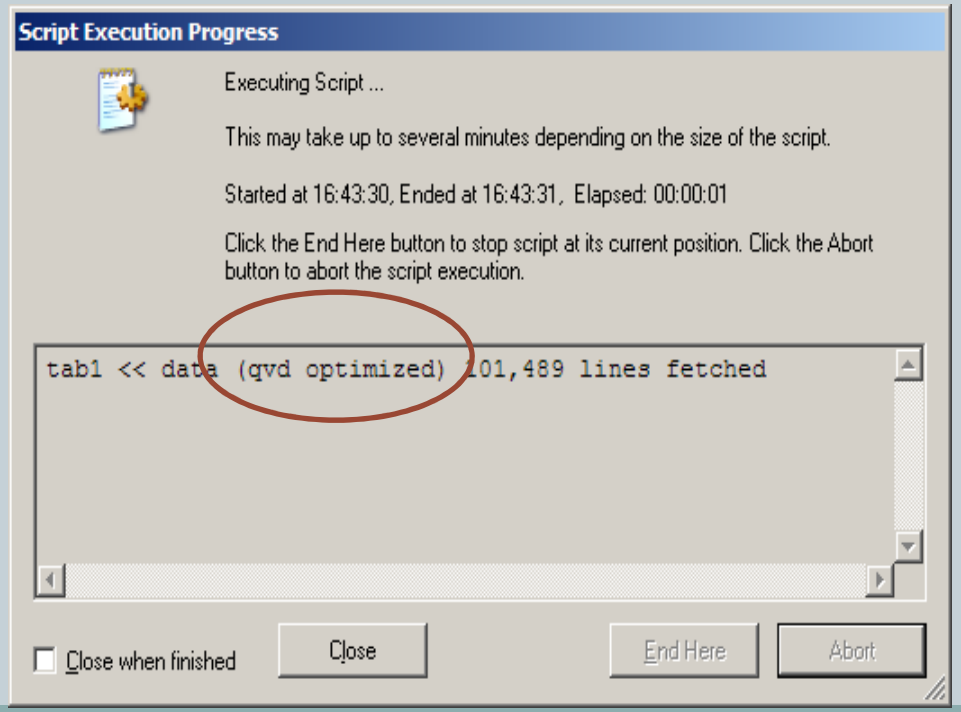
Loading QVD - BUFFER

- May be used to reload DBMS tables in the same qvw on different frequencies.
- This qvw is reloaded hourly.

```
Orders:
// Orders are loaded on every reload
SQL SELECT * FROM Orders;
Customers:
// Customers are loaded only once per day
BUFFER (stale after 1 days) SELECT * FROM
  Customers;
```

Optimized Load

- **Optimized load (super fast) will occur if no transformations or WHERE predicates. Optimized load indicated by message in script progress window.**



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Optimized Load Limitations

- Optimized Load Limits
  1) `F1 as newfield` – yes, rename allowed
  2) `F1 * 2 as newfield` – no, transformation
  3) `1 as newfield` – no, cannot add new field
  4) `where exists(F1)` – yes, single field exists()
  5) `where exists(F1, F3)` – no, multi-field exists()
  6) `F1 as newfield where exists(F1)` – no

QVD as Map

- QVDs may be used in MAPPING LOAD except…
- Optimized load cannot be used. No error, but no mapping results.
- Solution is to force a non-optimized load:

```
EmpMap:
MAPPING LOAD EmpID, EmpName
FROM Emp.qvd (qvd)
WHERE 1=1
;
```

QVD Functions

- Several useful script functions obtain metadata from a QVD.
- Documented in “File Functions” section of Ref Guide. Examples:
  - **QvdNoOfRecords(*filename*)**
  - **QvdNoOfFields(*filename*)**
- Qvd Functions do not respect Directory statement. Specify full path relative to qvw.
- See Ref Guide for complete list

QVD Dictionary

- QVD Functions may be used with a filelist loop to create a dictionary of QVDs for reference

QVD Name	QVD Table Name	QVD Create Time	QVD Record Count	QVD File Size (KB)	QVD Field Count
Categories.qvd	Categories	2010-08-31 8:47 pm	8	171	4
Customers.qvd	Customers	2010-08-31 8:47 pm	91	17	11
Employees.qvd	Employees	2010-08-31 8:47 pm	9	393	18
EmployeeTerritori...	EmployeeTerrit...	2010-08-31 8:47 pm	49	2	2
Invoices.qvd	Invoices	2010-08-31 8:47 pm	2,155	127	26
OrderDetails.qvd	Order Details	2010-08-31 8:47 pm	2,155	19	5
Orders.qvd	Orders	2010-08-31 8:47 pm	830	67	14
Products.qvd	Products	2010-08-31 8:47 pm	77	10	10
Region.qvd	Region	2010-08-31 8:47 pm	4	2	2
Shippers.qvd	Shippers	2010-08-31 8:47 pm	3	2	3
Suppliers.qvd	Suppliers	2010-08-31 8:47 pm	29	10	12
Territories.qvd	Territories	2010-08-31 8:47 pm	53	3	3

QVD Dictionary

- QVD Field Analysis

QVD Field Name	
Address	4
BirthDate	1
CategoryID	2
CategoryName	1
City	4
CompanyName	3
ContactName	2
ContactTitle	2
Country	4
CustomerID	3
CustomerName	1
Description	1
Discontinued	1
Discount	2
EmployeeID	3
ExtendedPrice	1
Extension	1
Fax	2
FirstName	1
Freight	2
HireDate	1
HomePage	1
HomePhone	1
LastName	1

Field Occurance

QVD Field Name	QVD Name	Categories	Customers	Employees	EmployeeTerritories	Invoices	OrderDetails	Orde
Address			X	X		X		
BirthDate				X				
CategoryID		X						
CategoryName		X						
City			X	X		X		
CompanyName			X					
ContactName			X					
ContactTitle			X					
Country			X	X		X		
CustomerID			X			X		
CustomerName						X		
Description		X						
Discontinued								
Discount						X	X	
EmployeeID				X	X			
ExtendedPrice						X		
Extension				X				
Fax			X					
FirstName				X				
Freight						X		
HireDate				X				
HomePage								

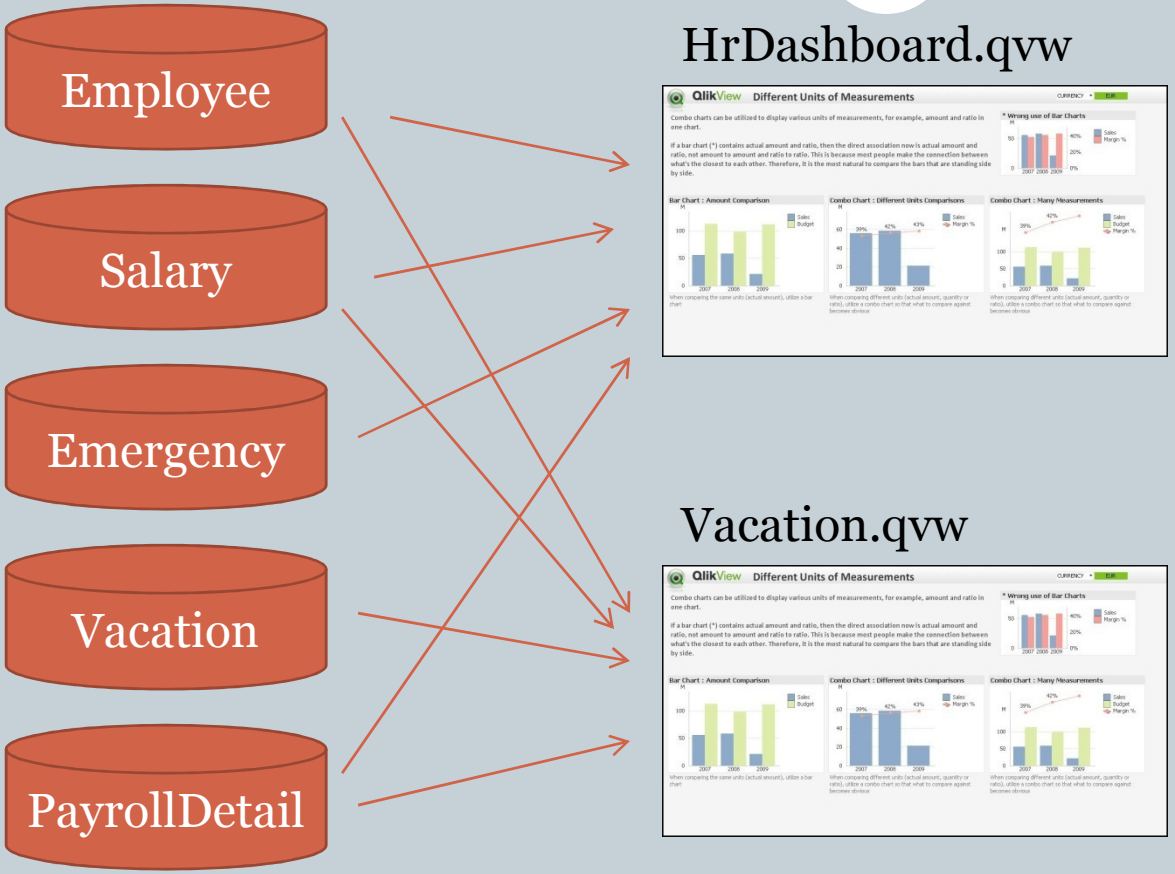
QVX

- New with V10 -- **Q**lik**V**iew data e**X**change
- “Open variant of QVD”
- Not quite as fast as QVD
- May be used to create high performance input files from sources where ODBC drivers are not available.
- Read by standard LOAD script statement.
- MetaFunctions **--QvdNoOfFields(** ***filename*** **)**

ARCHITECTURES

Basic "Single Tier" Model

Datasource



A *.qvw contains the ETL script, loaded data & screen objects.

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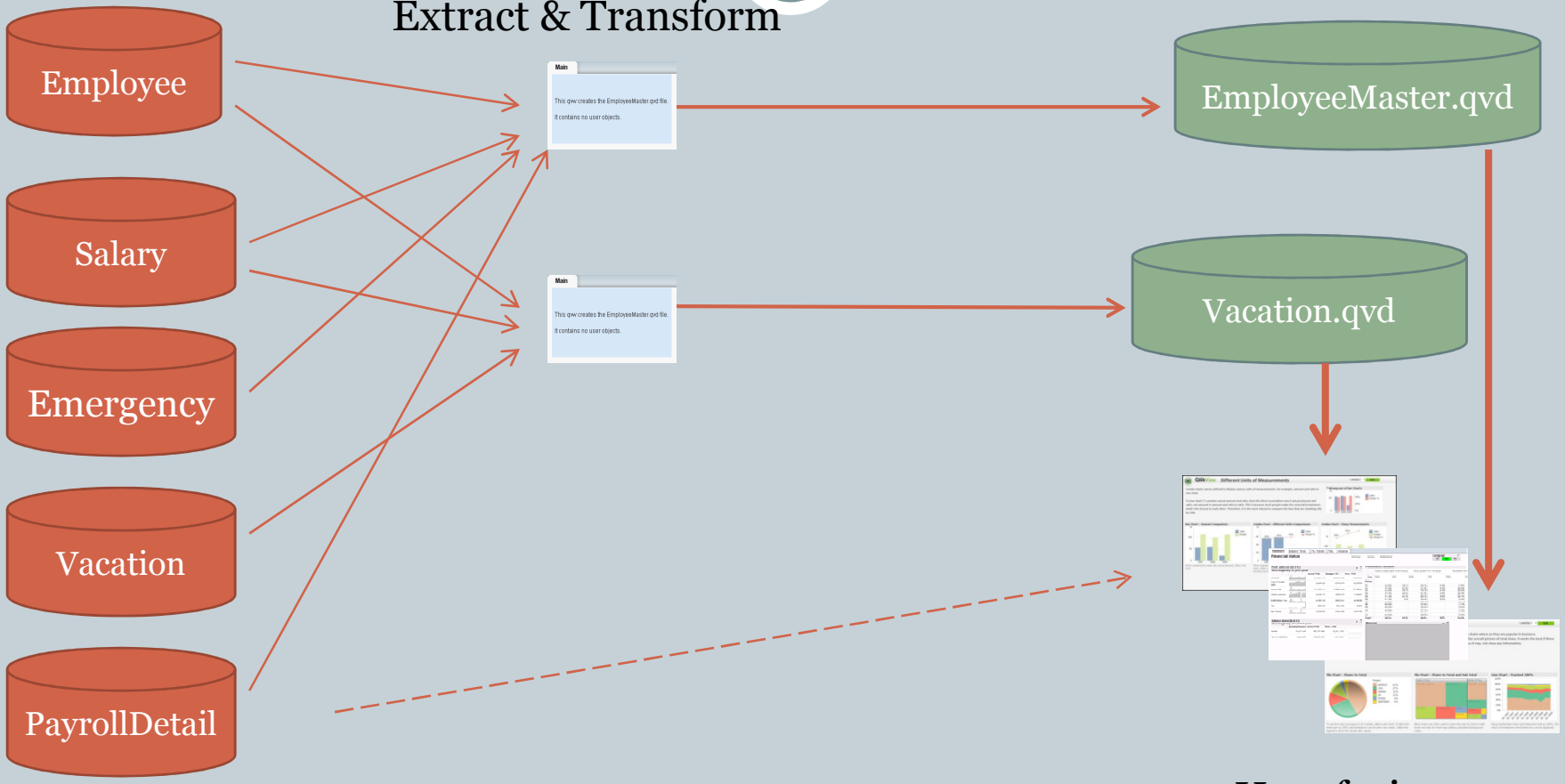
Two Tier Model



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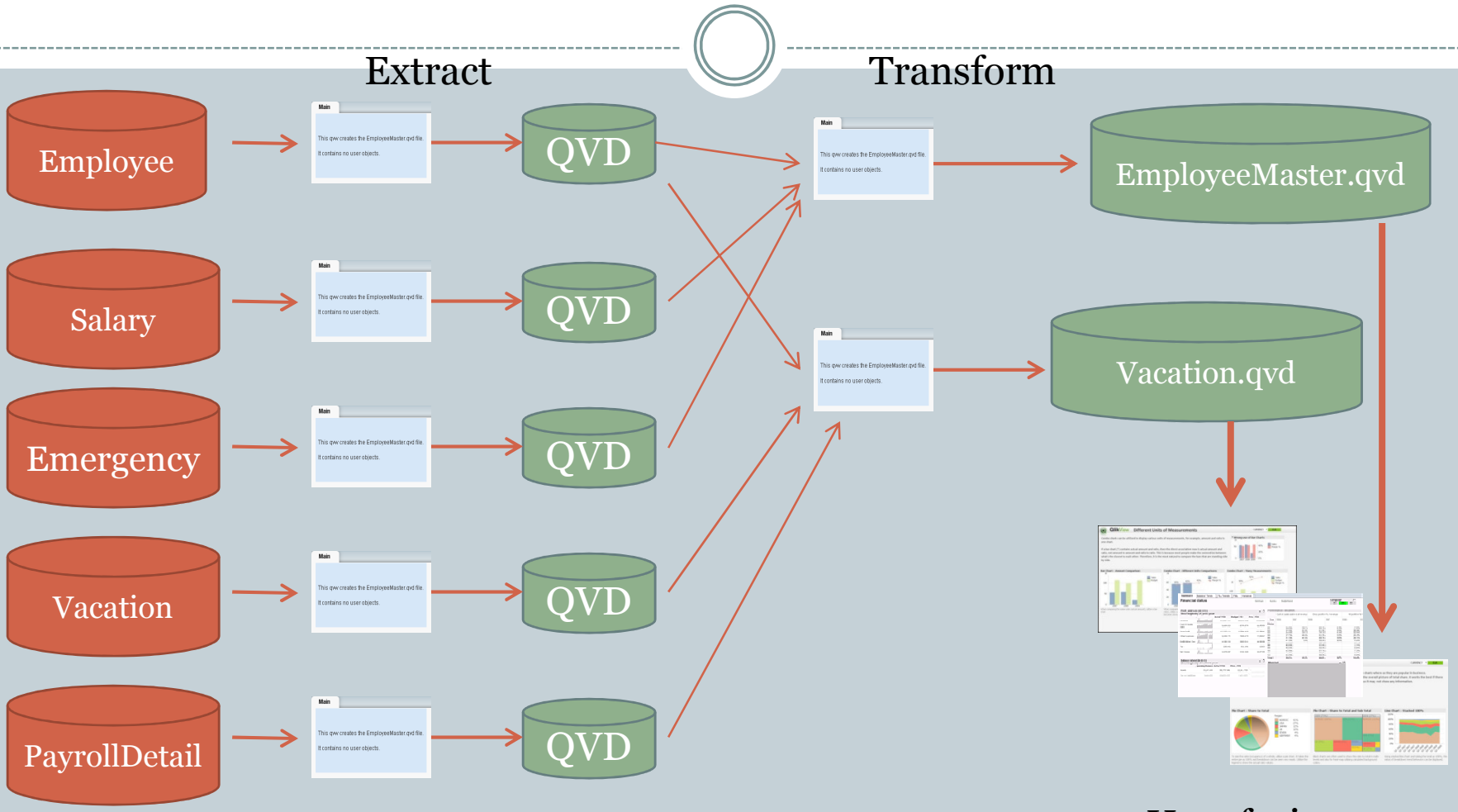
Three Tier Model



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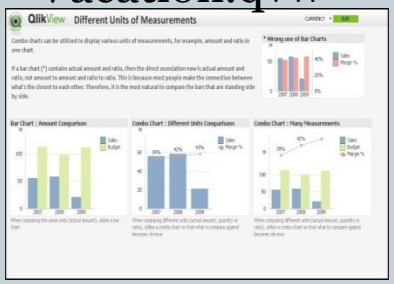
Bonus -- QlikMarts

QVWs may also be consumed as datasources.
Script: `BINARY Vacation.qvw;`

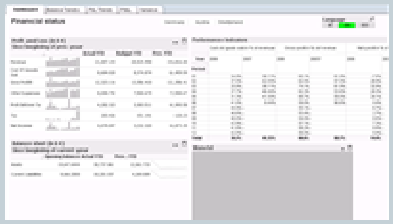
EmployeeMaster.qvd

Vacation.qvd

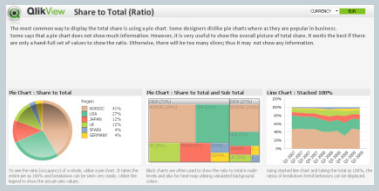
Vacation.qvw



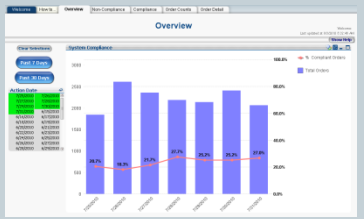
Repurpose the data model of a qvw for different UI audiences.



VacationByDept.qvw



VacationForecast.qvw



VacationSelfServe.qvw

Questions and Next Steps

Learn More about our QVD Data Model Pack at…

www.factory-ims.com

Questions?

Please use the Q&A feature in WebEx

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Contact Us

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