UNIVERSIDADE FEDERAL DO RIO GRANDE DO SUL
INSTITUTO DE INFORMÁTICA
CURSO DE CIÊNCIA DA COMPUTAÇÃO

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Business Intelligence Consultant
Development of a Qlikview Application

Final-year Internship Report presented in partial fulfillment of the requirements for the degree of Bachelor of Computer Science

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Lyon – France
2016

ACKNOWLEDGEMENTS

First of all, I would like to thank David LORIEUX who has trusted me and allowed me to integrate the Industry agency of B&D in Lyon.

I then wish to thank Boris JUSTE who has welcomed me in his team, for his advice during the projects.

I would like to thank Laura CLEMENT for her advice on QlikView. I also want to thank Lorraine GAREL, Kevin HAREL and Mohamed MAROUF for their welcome, their help and the good atmosphere in the team.

Finally, I thank all the people I have had the opportunity to work with during this internship, who helped me to discover and appreciate this facet of the IT industry.

I would also like to thank Claudio GEYER who helped me during the year I spent at UFRGS and then kept contact to allow me to present this TCC.

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Resumo

Sou estudante em intercambio na UFRGS, estudei na INF de Augusto 2014 até Julho 2015. Estou fazendo um programa de dupla-graduação entre UFRGS e PHELMA. Para obter este graduação, eu fiz um estágio de seis meses de Septembro 2015 até March 2016.

Eu fiz o meu estágio na "Business & Decision" em Lyon, França. "Business & Decision" é uma empresa de consultoria que oferece o seus serviços principalmente no setor de Business Inteligence.

O objetivo do estágio consistia em desenvolver relatando aplicações, usando diversos progamas : Qlikview e SSRS para o cliente Louis Dreyfus Commodities. Eu trabalhei em um projeto que consistiu no desenvolvimento de uma aplicação para a equipe financeira, para ajudá-los a verificar o tempo gasto em suas taefas diárias.

Palavras-chaves: Intelligência de negocios, relatando, Qlikview, Microsoft BI, SQL Server, SQL Management Services, SSRS

Summary

I am a student from PHELMA and did an exchange at the UFRGS. I studied in the INF department from August 2014 until July 2015. I am currently doing a double degree with UFRGS and PHELMA. In order to obtain this degree, I did a six months internship for September 2015 until the beginning of March 2015.

I did my internship at Business & Decision, in their office in Lyon, in France. Business & Decision is a consulting firm offering its services to clients mainly in the Business Intelligence sector all around the world.

The internship subject was to participate in the development of Reporting applications, in Qlikview and SSRS for the client Louis Dreyfus Commodities. I mainly worked on a project that consisted in developing an application for the financial team, to help them check the time spend on their everyday tasks.

Key words: Business Intelligence, Reporting, Qlikview, Microsoft BI, SQL Server, SQL Management Services, SSRS

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UFRGS	Universidade Federal do Rio Grande do Sul
PHELMA	Physic Electronic Material
INF	Institute of Informatics
B&D	Business & Decision
LDCOM	Louis Dreyfus Commodities
TPAM	Third Party Application Maintenance
POC	Proof Of Concept
KPI	Key Performance Indicator
SSC	Shared Services Center
SLA	Service Level Agreement
OLA	Operating Services Agreement
T&E	Travel & Expenses
BPM	Business Process Management
PO	Purchase Order
GL	General Ledger
SSRS	Sql Server Reporting Services
SSIS	Sql Server Integration Services
SSAS	Sql Server Analysis Services
SSMS	Sql Server Management Services
ALM	Application Lifecycle Management

1 - Introduction

As part of my engineer formation, I did a six months internship at Business & Decision, in their office in Lyon, in France. It started on the 7th of September, 2015 and ended on the 29th of February, 2016. Business & Decision is a consulting firm offering its services to clients mainly in the Business Intelligence sector.

This internship's goal is to confront me with the work in a firm so I can use what I have learnt at the engineering school and prepare myself to get into the active life. It is also the first time I get to work for a long time in one place which allows me to take part in projects of a certain magnitude.

I chose Business & Decision for several reasons. First of all, it is a consulting firm multi-specialized with lots of advantages. It offers for example the opportunity to work with many tools across different areas of expertise, not only technical but also functional (AMOA, development of reporting applications). I will have the opportunity to work on projects of different size, for large companies of national or even worldwide scale. The possibilities of discovery, learning and evolution are thus numerous. In addition, the specialties of Business & Decision are based on Business Intelligence. It is a young and growing field linked to new technologies as Big Data.

I will first introduce the environment in which I did my internship, a description of the Business & Decision company and the development process I was integrated in. Then I am going to explain the goals of my internship and describe the projects I worked on. And finally, I will present the details of my work, the different parts of the KPI Accounting project.

2 – Working Environment

2.1 - Business & Decision [1]

Business & Decision is a software and computing services company. It was founded in 1992 by Patrick Bensabat. It is composed of 25 000 employees working in 15 countries across the world, it realized more than 200 million Euros of turnover in 2014.
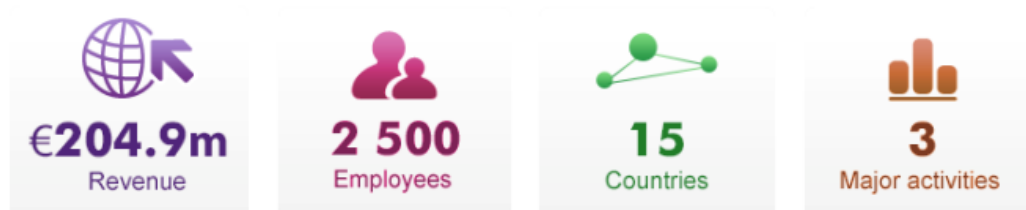

Figure 1 – Main figures of Business & Decision

Business & Decision is multi-specialized and distinguishes itself in three domains of expertise:

- **Business Intelligence** (65 % of the turnover)

It is the main activity of Business & Decision. It consists in collecting, strengthening and restoring the data of a company in order to help her making decisions. It permits leaders to have a clear vision of their activities.

- **Customer relationship management** (15% of the turnover)

It consists in capturing, processing and analyzing information about customers of a certain company. The goal is to win the loyalty of the clients in offering him services more adapted to his needs. Communication and offers are to be targeted to a specific client in order to better fit his profile.

- **E-commerce** (20% of the turnover)

E-Business (other name for e-commerce) designs the processes created to ensure a sale. It comports several applications such as the management of online sales, customer relations or the supplier order.

2.1 – The client: Louis Dreyfus Commodities [2]

Louis Dreyfus Commodities employs more than 30 000 people and is active in more than 90 countries. It represents almost 10% of the world's raw materials trading and ranks first in trading cotton and rice. With the hike in raw material prices, the company grows quickly and multiplies its net result by 10 between 2005 and 2010. Currently the company makes more than 70 billion in revenue.

Two years ago, Louis Dreyfus Commodities (LDCOM) opened a center of expertise in Lyon, with employees working from IT management to the administration through trading and financial centers.

With the expansion of its group, LDCOM turned to Business & Decision to support its development effort. Thus B&D has been helping LDCOM in its grows with a third party application maintenance (TPAM) and several projects.

The advantages of a TPAM for a company like LDCOM are multiple. TPAM guaranties the operational performances thanks to evolutions and corrections. On a global scale, it assures a better control of the maintenance and of the costs.

2.3 – Third Party Application Maintenance

The main axe of this TPAM is the reporting. The goal is for LDCOM to use the reports to answer questions like "What were the cash flow between April and September 2015?"

The maintenance of the TPAM is done through a systematic process. The different steps of this process (cf Figure 2) allow the traceability of the updates. This process is realized through different batches subdivided into several tickets and it is been tracked on Redmine [3], an open source web-base project management software. This permits for both B&D and LDCOM to exchange about the batch, obtaining for example missing information.

The first step of the process is to collect the need through functional specifications. They are then transcribed into technical specifications. Once it is done and has been approved, the development starts. It is then tested and delivered for validation. The deployment is later done first in the pre-prod environment and ultimately it is deployed in the production environment.
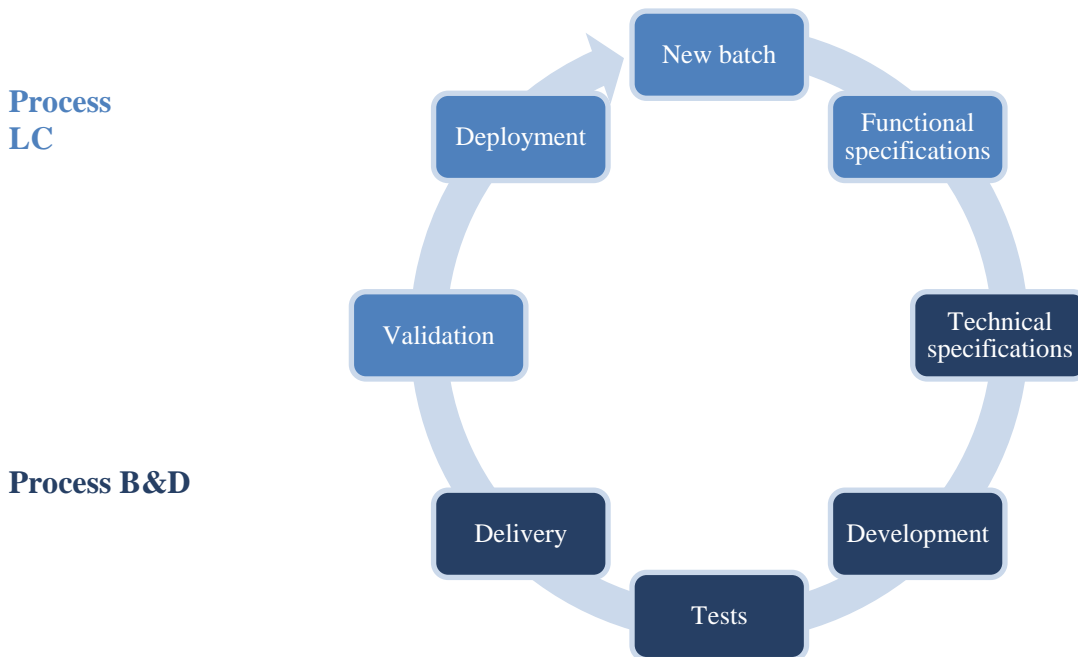
Process LC

Process B&D

Figure 2 – Workflow of a typical project

3 – Internship goal

3.1 – KPI Accounting

The finance team of Louis Dreyfus Commodities is working with several organizations, which are Shared Services Centers (SSC). When those SSC ask them to do some work (invoice, travel, intercompany...), an instance is created and is composed of several tasks, each one being treated by a person in a certain amount of time. The goal of the application is to compare the time passed on each instance with the reference time defined by LDCOM and the SSC.

The figure 3 shows two instances, one is created after a request from the SSC, it took 3 hours to finish it and the reference time is 3 hours, so the instance is a success (it was finished in time). This value calculated is an Operating Services Agreement (OLA) as it is an instance treated by the company. On the contrary, the other instance is a Service Level Agreement (SLA) as it is treated by the SSC. The target is 4 hours however, it took them 5 hours to finish it, and hence, it is failed.
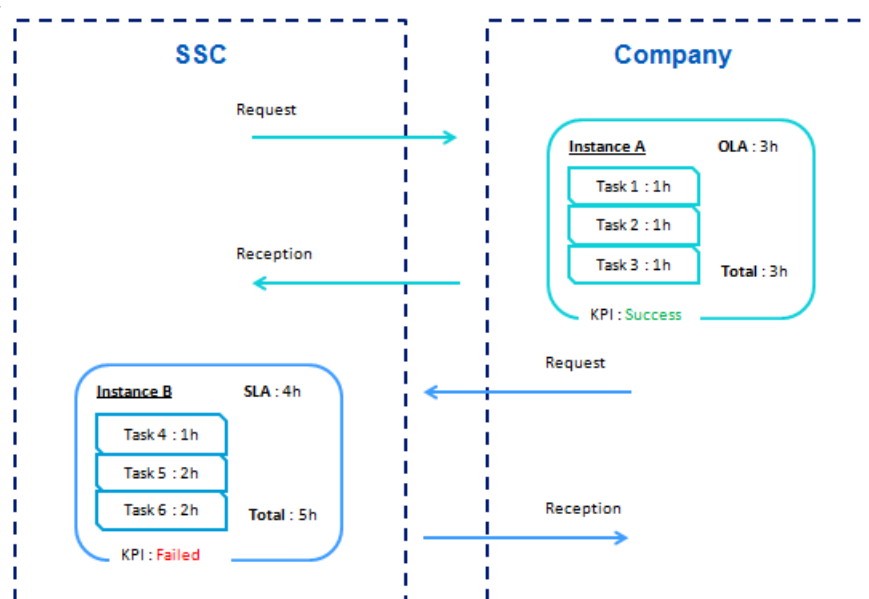
Figure 3 - Definition of the scope

The idea of the application is to show several Key Performance Indicators (KPI), comparing how many failed in comparison with those that succeeded. For example, they would like to know whether the time between the reception of an invoice and its rejection is under the target or not. The finance team defined the indicators they wanted, and told me how to calculate them. Some of them would check the time spent by the SSC, those are called Service Level Agreement (SLA) and others are checking the work done by the company, it is an Operating Services Agreement (OLA).

The project has a scope of 11 distinct domains (KPIs families) and each family is composed of different OLA and SLA KPIs. In total, 46 KPIs are to be created. As it is a large scope we first delivered 4 families with a total of 20 KPIs (cf Figure 11 in Annexe). Following are the names given by the financial team; I implemented the definition they gave me:

- **Account Payable**

Its role is to coordinate and monitor the invoice approval process, to process general and administrative invoice payment and to book the commercial invoices in case the front office system is not fully integrated with the accounting system.

SLA KPIs:
- Cycle time of invoice receipt to invoice posting in the database
- Cycle time of invoice receipt until rejection
- Value (in US dollars) of invoice back-log / ageing of non-processed

OLA KPIs:
- Percentage of invoice covered by PO
- Percentage of invoice approved/rejected on time
- Percentage of invoice rejected due to formal errors

- **Travel Expenses**

It should audit and process Travel and Expenses (T&E) claims and process T&E payments.

SLA KPIs:
- Cycle time in days to approve and schedule T&E reimbursements
- Cycle time between claim receipt and claim submission for management approved
- Percentage of time T&E claims are processed error free

OLA KPIs:
- Percentage of claims rejected due to formal errors
- Percentage of claim approved with cycle time > 24h

- **General Ledger**

The goal is to process the journal entries

SLA KPI:
- Percentage of time GL entries were not posted within request cycle time target

OLA KPIs:
- Percentage of incomplete posting requests returned to sender
- Percentage time journal entries approved within stipulated time

- **Ask A Question**

SLA KPIs:
- Volume SLA
- Time SLA
- Quality SLA

OLA KPIs:
- Volume OLA

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- o   Time OLA
- o   Quality OLA

For each KPI family, I had to provide a sql procedure to load the data present in several database into the Data Warehouse. The user wanted to have two SSRS reports for each family, one "direct" and another "details". In addition, he wanted a QlikView application, regrouping the different KPIs of all the KPI families together.

3.2 – SSRS Reports

3.2.1 – Direct

One of the needs of the client was to have a report which would be plugged on the database directly (and not the Data Warehouse) in order to have real-time information. They wanted to have a listing of all the tasks present in the database with several parameters to help visualizing the data. The calculation of the KPIs are not needed in this report, the user will only have an access to the list of tasks. This report will be accessed by the users directly on the SharePoint.

3.2.2 – Detail

The client also wanted another SSRS report, which this time had to be plugged on the Data Warehouse. This report was to be accessed from QlikView so the parameters have to be the same in both environments. In the QlikView application, the user would see the KPIs, calculated on an instance level, and in the SSRS report, he would see the tasks corresponding to this instance.

3.3 – QlikView Application

The QlikView application is plugged on the Data Warehouse, I had to load the data in a first level, then in a second level, I had to define the model, aggregate the data by Instance ID and calculate the different KPIs. And in a third level, I had to present the different KPIs values to the user, add links that would direct the user to the SSRS Report and show him the tasks corresponding to the Instance he had selected.

4 – Business Intelligence and its tools

4.1 – Business Intelligence

Business Intelligence is a process for analyzing data and presenting actionable information to help corporate executives, business managers and other end users making more informed business decisions [4]. Companies are collecting and storing a large amount of data for their business operations. To keep track of that information, several software programs are proposed on the market. They are designed to extract important data from the massive raw data existing and reveal the insights through reports, dashboards [5] to make the results available to decision makers. The process to do so always follows the same steps:
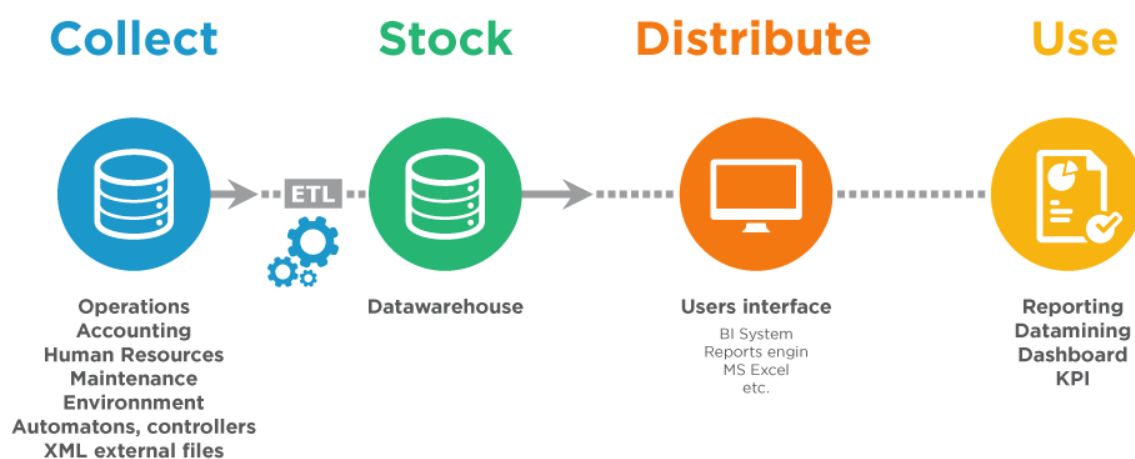

Figure 4 – Steps of the data recuperation [6]

4.2 – Microsoft BI - SSRS

Microsoft BI is composed of three different tools:

- **Integration Services** (SSIS [7]): Component of the Microsoft SQL Server database software that can be used to perform a broad range of data migration tasks.
- **Analysis Services** (SSAS [8]): Online analytical processing and reporting tool in Microsoft SQL Server.
- **Reporting Services** (SSRS [9]): Server-based report generation software system from Microsoft enables users to quickly and easily generate reports.

This suite has several advantages, it has for example a great compatibility with other Microsoft software such as SQL Server or SharePoint. It has also the possibility of exporting results in excel or in PDF.

SSRS and SQL Server Management Studio (SSMS, the Microsoft tool that manage databases) are the tools I mostly used during my internship. SSMS is used to question the database thanks to sql procedures. SSRS allows the construction, the execution and the export on SharePoint of reports. It is compatible with several data sources such as Oracle, XML or SQL Server.

In my case, the report is supplied by an SQL Server database through a procedure. It allows us to add variables to the request sent to the SQL database in function of the parameters chosen by the user (cf Figure 4).
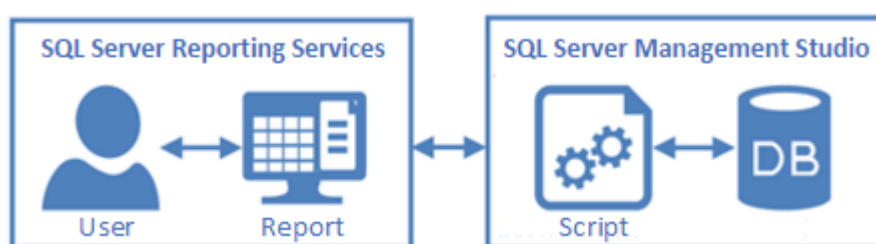

Figure 5 – Link between SSRS and SSMS

SSRS is also capable to interrogate the database directly. However, this is less efficient because the SQL engine is not optimized to do that type of operation.

This kind of report is not in-memory based, the database is interrogated at every execution. It allows the user to have real-time information (in case the database is correctly updated) but it might be slow in case the number of data queried is important.

To result, SSRS possesses different advantages and drawbacks:

+	Real-time	The data consulted by the users come directly from the database.
+	Accessibility	Reports are accessible on the Internet (SharePoint)
+	Portability	Reports are built to be exported in PDF or Excel.
+	Compatibility	SharePoint, SSRS and SQL Server are all Microsoft software built to communicate with each others.
-	Slow	Data are non stocked in-memory, they need to be recuperated each time a user consult a report or change a parameter.
-	Aesthetic	The possibilities of aesthetics of an SSRS report are not as good as its concurrent.

Table 1 – SSRS advantages and drawbacks

4.3 – QlikView [10]

Software developed by QlikTech, QlikView is an in-memory reporting solution known because it is easy to use, for example to create graphics, thanks to its aesthetics and because its response time is almost instantaneous.

However, the in-memory technology requires powerful machines because the data sources are loaded, treated and conserved in-memory during the execution of a report. To do so, QlikView uses a script system (cf Figure 5) allowing us to load and modify data from different sources. This is quite similar to the SQL procedures used for SSRS. This process still needs a Data Warehouse because the resources needed by the system directly depends on the quantity of data loaded. The step which reloads the data can take time, it is usually programmed during the night.
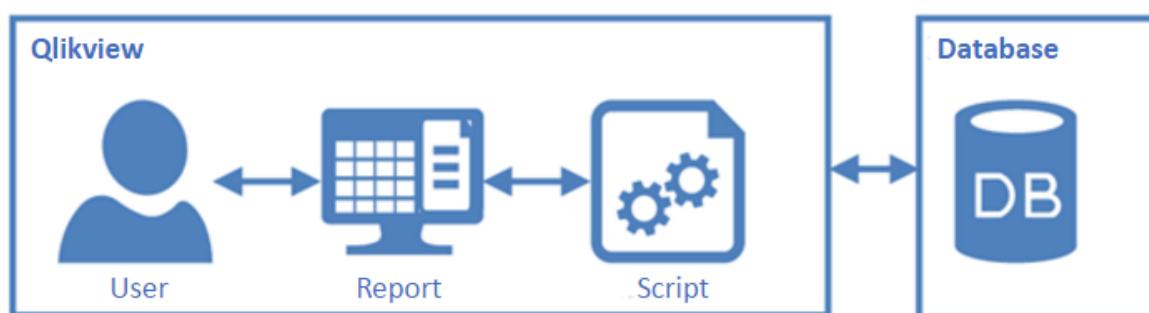

Figure 6 – Description of the QlikView use

QlikView usage at first demands a certain technicality when using the mapping of the data. Indeed, all the "join" operations are automatically done with the data possessing the same column name. The software identifies the primary keys and if needed creates automatically mapping tables. In order to keep a clear model, it is often necessary to get around this and rename some columns or create a table with all the keys. The users can find the QlikView reports online and reload them online as well.

To result, QlikView possesses different advantages and drawbacks:

+	Responsiveness	The in-memory technology allows a quasi instantaneous recuperation of the data loaded.
+	Accessibility	Reports are accessible on the Internet.
+	Aesthetic	The possibilities for the report aesthetic are multiple.
+	Portability	Reports are built to be exported in PDF or Excel.
+	Compatibility	Possibility to load data from various types of sources.
-	Performance	The in-memory systems require powerful computers.
-	Non-real time	The freshness of the data depends on the frequency of reloading

Table 2 – QlikView advantages and drawbacks

5 – Description of the work

5.1 – Technical Specifications

For each KPI family, the first part of my work was to understand the needs of the client. I was provided with functional specifications and had to give the client technical specifications about the two SSRS reports I was about to develop and about the QlikView application as well.

In the functional specifications, I had the fields I needed to recover, but I had to specify their type in order for the people implementing the Data Warehouse to start their work. I also had to specify the parameters taken by the reports, which values they would be able to take, would they be mandatory or optional.

During this phase of specification, I was in constant contact with the person responsible of the functional needs of the client in order to understand better their demands and the scope of the project.

5.2 – Data Loading

For each KPI family, the data needed for the project is located in 5 different tables (cf Figure 6).
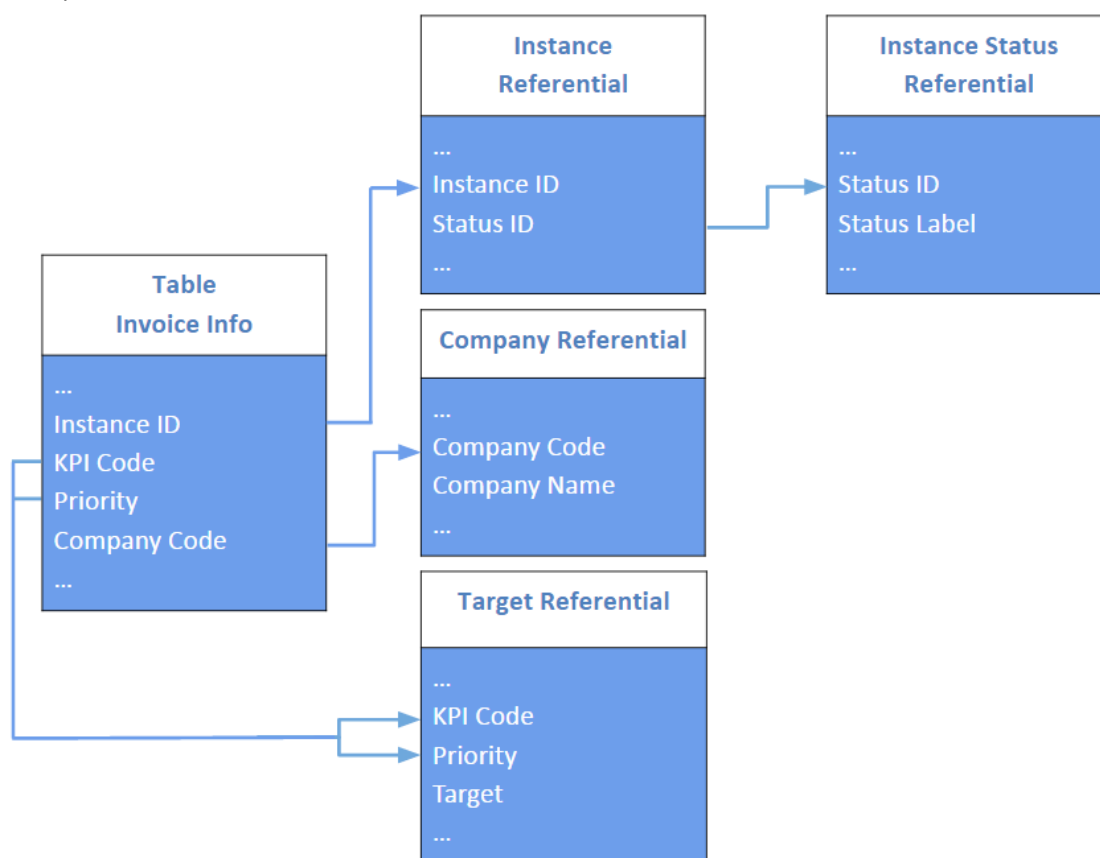

Figure 7 – Model for KPI Account Payable

The data about the different KPIs families are located in different tables and even so the fields are the same (each table contains a column with company codes) the names of the columns are not the same, so I had to standardize the data.

The information was present in detail in the database, data was provided on a task level. However, the calculation of each KPI had to be done by instance. Two options were possible to implement the calculation of the KPIs:

- We could add a column for each KPI calculated, the column having the name of the KPI
- We could replicate the data for each KPI and add only two columns, one with the KPI value and the other with the KPI value.

We chose to replicate the information because the volume of data was not that important and it simplified the calculation of the different KPIs.

One problem was the calculation of the Elapsed Time for each instance. Indeed, possessing the Completion Date (date of the end of the task) and the Received Date (date of the beginning of the task) the calculation was not simply the difference of those two dates, week-ends needed to be removed. All the dates were stocked in the Geneva timezone, however, some tasks were done in the United Arab Emirate country where week-ends are on Friday and Saturday, so we had to translate the dates in the local time and then suppress either Saturday/Sunday or Friday/Saturday. To reduce the complexity of the code, this calculation was done in an external function.

5.3 – SSRS Reports

5.3.1 – Direct

The first point to develop the "direct" report was to create the sql procedure that would retrieve the data from the different tables. It was quit the same work as the one done to load the data into the Data Warehouse. The main difference was that no calculation was done in this report so the data was not replicated.

The main point was the implementation of the parameters (cf Table 3). Indeed, to file the values present in the report, procedures had to be created to get the different SSC/Region/Country and Companies present in the database. Another option would have been to create a Freetext, but then, if a user does not write the country well for example, he will not see any data.

In the procedure, I had to pay attention to the fact that some parameters would be passed as a list of values and other as a single value.

These procedures and reports were quite similar for all the KPIs families, only some fields differed from one family to the other. The main difference was on the field Priority, on the KPIs families "General Ledger" and "Ask A Question" it was present, since it was quite an important field, it was added to the parameters for these two families.

Parameter	Type	Filled in from	Comments
SSC	ListBox (MultiValue)	Sql procedure	Mandatory (only in SSRS)
Region	ListBox (MultiValue)	Sql procedure	Mandatory (only in SSRS)
Country	ListBox (MultiValue)	Sql procedure	Mandatory (only in SSRS)
Company	ListBox (MultiValue)	Sql procedure	Mandatory
Instance ID	Freetext (ex: "75%")		Optional
Instance Status	ListBox (MonoValue)	Manually	Optional
Task Name	Freetext (ex: "U%")		Optional
User Name	Freetext (ex: "B%")		Optional
Received Date From	Calendar		Optional
Received Date To	Calendar		Optional
Priority	ListBox (MonoValue)	Manually	Mandatory **(depends on the KPI family)**

Table 3 – List of the parameters of the direct report

The layout of the report (cf Figure 7) is composed of the filters on the top, a reminder of the chosen filters and finally a listing of the data recuperate by the sql procedure.
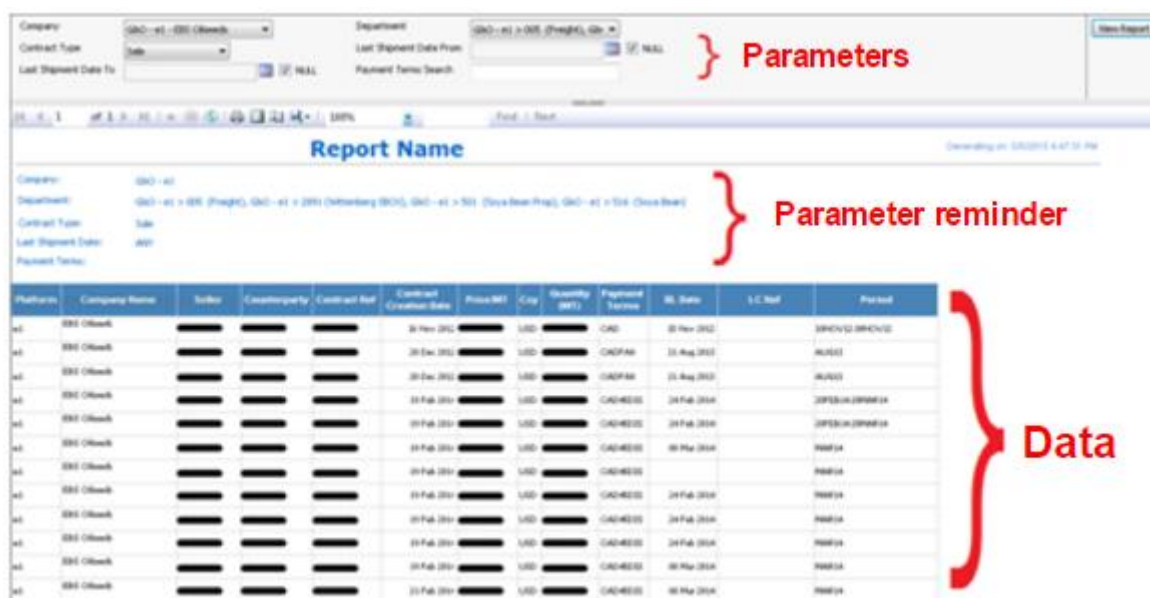

Figure 8 – Layout of the direct SSRS Report for the family Account Payable

5.3.2 – Detail

Contrary to the direct report, the procedure retrieves the data from the Data Warehouse. In this report, the layout is the same as the previous one, the main difference is that some parameters are different.

Since this report is accessed from QlikView, the date has to be on the same 'format'. Indeed, in QlikView the user can select different months or years, but he does not see the days, so a calendar type for the reporting date was not possible. I had to generate a calendar in a sql procedure with only months and years for this parameter.

The KPI Ratio parameter is used to select only the KPIs that met the condition. For example, for the KPI "Cycle time of invoice receipt until rejection", we calculate is by summing the instance whose the elapsed time is under the target, in case an instance meets this condition, its KPI Ratio will be 1, in other case, it will be 0. In QlikView, the user can select only the instances that meet the condition, we therefore need to have this parameter.

Parameter	Type	Filled in from	Comments
SSC	ListBox (MultiValue)	Sql procedure	Mandatory (only in SSRS)
Region	ListBox (MultiValue)	Sql procedure	Mandatory (only in SSRS)
Country	ListBox (MultiValue)	Sql procedure	Mandatory (only in SSRS)
Company	ListBox (MultiValue)	Sql procedure	Mandatory
Reporting Date From	ListBox (MonoValue)	Sql procedure	Optional
Reporting Date To	ListBox (MonoValue)	Sql procedure	Optional
Instance Status	ListBox (MonoValue)	Manually	Optional
KPI Code	Freetext (ex: "B%")		Mandatory
KPI Ratio	ListBox (MonoValue)	Manually	Hidden
Priority	ListBox (MonoValue)	Manually	Mandatory **(depends on the KPI family)**

Table 4 - List of the parameters of the detail report

5.4 – QlikView Application

The client did not have any expectations on this part, I was free to design the application as I wanted. To follow the process: Extract, model and then report, I created 3 files, one for each part of the process.

In the level one of the QlikView, I extracted the data from the Data Warehouse:
- Each KPI Family
- Country
- Company
- Commitment
- Target

In the level two, I built the data model:
- Aggregation of the data on an instance level, suppression of the tasks.
- Concatenation of the data about the different KPIs families in a fact table

The tables of reference are Target, Commitment, Country and Company. The problem is that when loading it (cf Figure 8), synthetic tables and loops were created, it is to be avoided in QlikView because it creates performances problems.
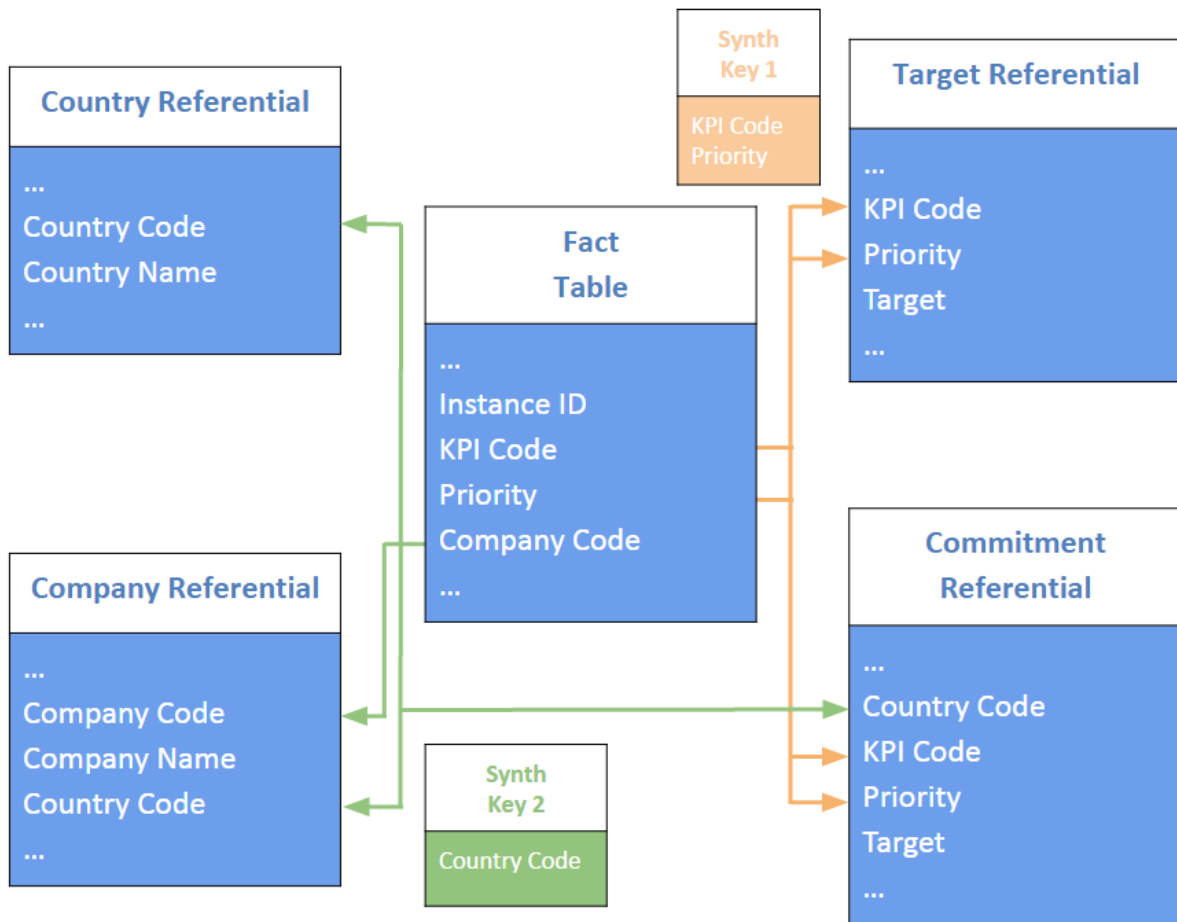
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Figure 9 – First QlikView model

In order to suppress the synthetic keys, mapping tables were created temporarily, mapping for example "KPI_Code" concatenate to "Priority" to a Target value. The model was simpler (cf Figure 9).
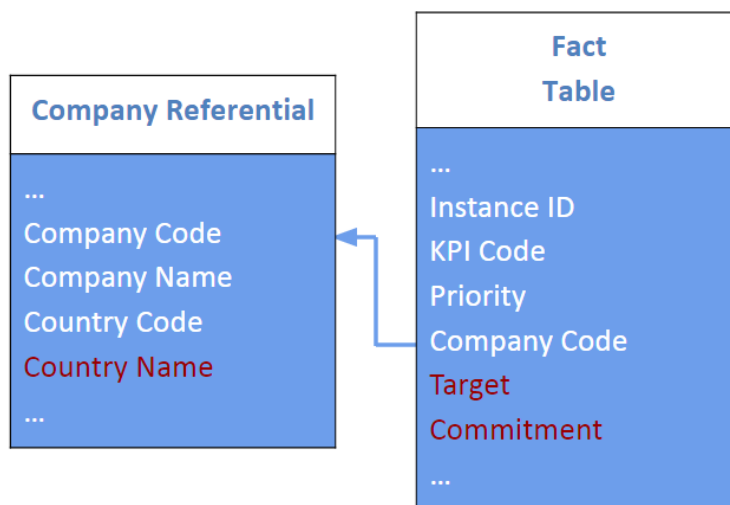
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Figure 10 – QlikView model

In the third level, in case the KPI was a single value, the sum of the invoice amount for example, the user would see the result of the calculation. In the other case, when the KPI is a count of the instances whose Elapsed Time is under the target, the user wants not only to have this number, but also the number of instances that fail the test. In addition he will see the average of the elapsed time (cf Figure 12 in Annexe).

5.5 – Tests

In order to test the SSRS reports, a process is set: tests are to be done on HP ALM [11] and unit tests are performed as well.

The unit tests consisted in listing the parameters and the fields selected in the stored procedure and used in the SSRS report and checking whether or not they feet the requirements.

I wrote the HP ALM tests and a colleague tested them. The idea is to write a scenario future user might do. I had to try and list all the functionalities in the test. The colleague would then follow the scenario and eventually notify me of something not working properly.

The QlikView application had to be tested, both the values of the KPIs and the links to the "details" SSRS reports had to be correct. It was quite long to click on all the links to check where we would be directed to, change the parameters and see whether it was passed in the URL as well but no automating could be done.

I proposed 3 designs to our team and they had to vote for the one they preferred. 25 persons participated in the test. They had to first navigate in the Qlikview application on

their own. Then, they were timed doing some research on the application, in order to find whether an application was easier to use.

Questions asked to the user:

1. Find the value of the KPI Cycle time of invoice receipt until rejection of April 2015.
2. Find the value of the KPI Percentage of claims rejected due to formal errors (Travel and Expense Family) for the SSC "Sofia".
3. Filter by Region "Europe", Company "AE01".
4. Give a mark to the 3 applications (from 0 in case it is not good to 5).

The first application had the filters on the left, and a sheet was created per KPI family and the buttons to move from a sheet to the other were on the top.

The second application had all the KPIs on a unique sheet, and the filters on the top.

The third application had a sheet per KPI family, the filters on the top and the buttons to move from a sheet to another on the left.

The average results were the following:

	Application 1	Application 2	Application 3
Question 1	2 sec	5 sec	2 sec
Question 2	2 sec	7 sec	3 sec
Question 3	2 sec	3 sec	2 sec
Question 4	4,5	1	4

Table 5 - Tests results

In conclusion, the first application (cf figure 13 in Annexe) and the third application were preferred, the first one was selected as it is more common to have the menu on the top rather than on the left. The second application was not appreciated because the user had to scroll as lot before finding the information he wanted.

6 – Planning

The planning was based was fixed with the client's need and the priority was to deliver every KPI family on time with the planning fixed on the beginning with the client.

	Task	Sept	Oct	Nov	Dec	Jan	Feb
	Getting started with QlikView						
	Understanding the functional specifications						
	Development of POCs and evolutions of current applications						
First KPI Family	Redaction of the technical specifications						
	Validation of the technical specifications ⭐						
	Development of the sql procedure to load data						
	Development of the sql procedure to load SSRS direct report						
	Development of the SSRS direct report						
	Development of the sql procedure to load SSRS detail report						
	Development of the SSRS detail report						
	Conception of the database model for the QlikView application						
	Development of the QlikView layout						
	Tests QlikView						
	Tests UT SSRS reports						
	Tests HP ALM SSRS reports						
	Delivery first KPI family ⭐						
Second KPI Family	Redaction of the technical specifications for the second family						
	Validation of the technical specifications ⭐						
	Development of the sql procedure to load data						
	Development of the sql procedure to load SSRS direct report						
	Development of the SSRS direct report						
	Development of the sql procedure to load SSRS detail report						
	Development of the SSRS detail report						
	Development of the QlikView layout						
	Tests QlikView						
	Tests UT SSRS reports						
	Tests HP ALM SSRS reports						
	Delivery second KPI family ⭐						
Third KPI Family	Redaction of the technical specifications for the first family						
	Validation of the technical specifications ⭐						
	Development of the sql procedure to load data						
	Development of the sql procedure to load SSRS direct report						
	Development of the SSRS direct report						
	Development of the sql procedure to load SSRS detail report						
	Development of the SSRS detail report						
	Development of the QlikView layout						
	Tests QlikView						
	Tests UT SSRS reports						
	Tests HP ALM SSRS reports						
	Delivery third KPI family ⭐						

	Task	Schedule
Fourth KPI Family	Redaction of the technical specifications for the first family	
	Validation of the technical specifications ⭐	
	Development of the sql procedure to load data	
	Development of the sql procedure to load SSRS direct report	
	Development of the SSRS direct report	
	Development of the sql procedure to load SSRS detail report	
	Development of the SSRS detail report	
	Development of the QlikView layout	
	Tests QlikView	
	Tests UT SSRS reports	
	Tests HP ALM SSRS reports	
	Delivery fourth KPI family ⭐	
	Redaction of the report	

7 – Conclusion

I built a working application which is now deployed and used by the client. I developed a QlikView application for the client to see 20 KPIs divided into 4 KPIs families. I developed 4 stored procedures (one for each family) that would load data present in the database into the DataWareHouse. In addition, I developed stored procedures that take data from the DataWareHouse and are put in SSRS reports (also created by me) that are now accessible to the client on their SharePoint.

Within this company, I learnt a lot: I started discovering new tool QlikView, I took part in the BI projects of LDCOM, allowing me to gin not only from an intellectual point of view but also human one. Indeed, communication is primordial in our everyday work.

Communication with the client: to understand his needs and his intentions but also to make him understand the possible improvement and limitations.

Communication within the team: to share knowledge to progress, help each other.

This internship prepared me to enter into the active life, I have become autonomous in my work and now know how a firm is functioning. I am becoming more and more confident in QlikView, being able to design a database model for a new project and the entire layout as well.

In addition I enjoyed working with this company and in this team where the atmosphere was excellent, I will continue to work there and gain even more experience.

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9 – Annexes
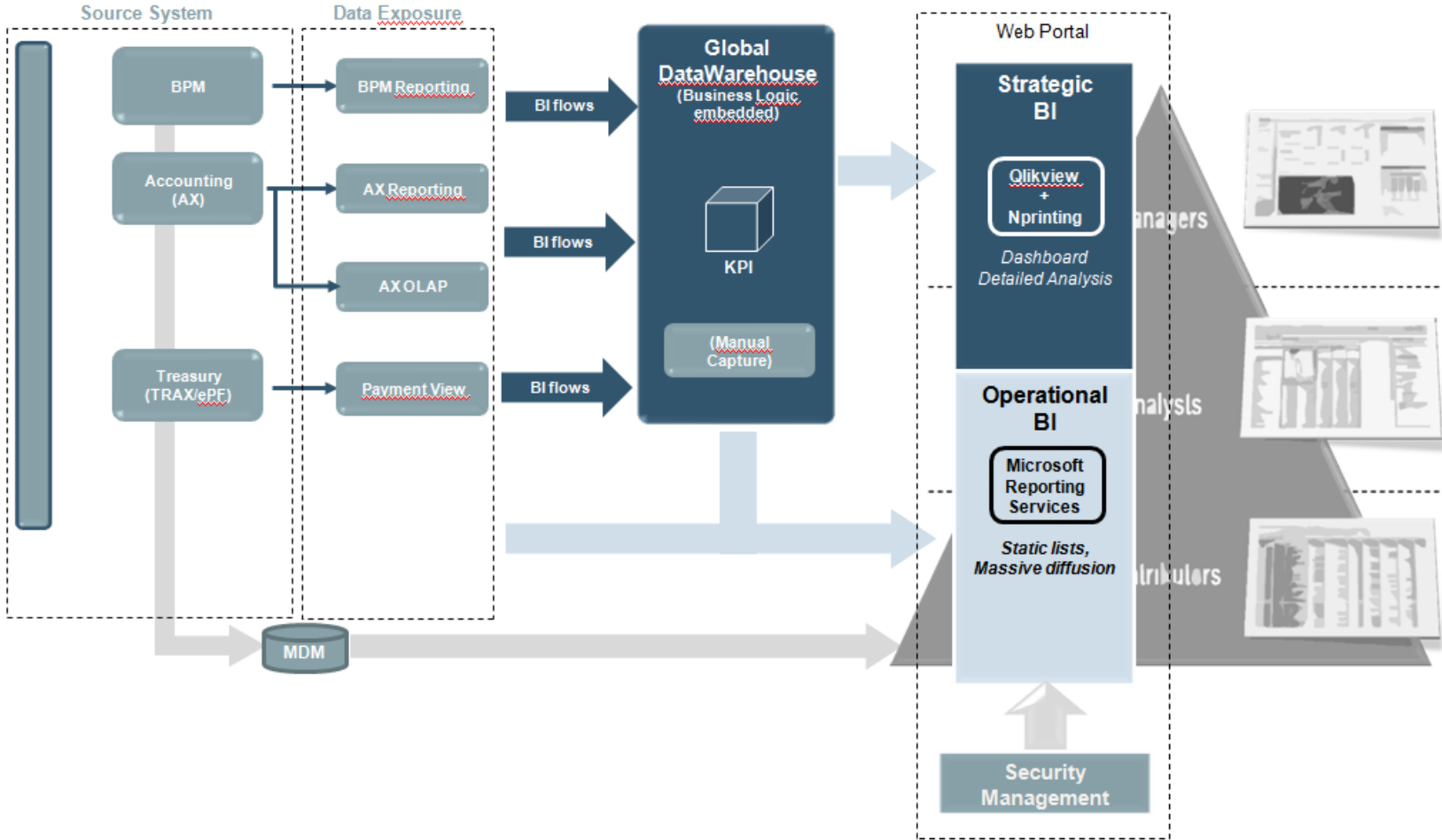
Figure 11 - Global Data Landscape of KPI Accounting
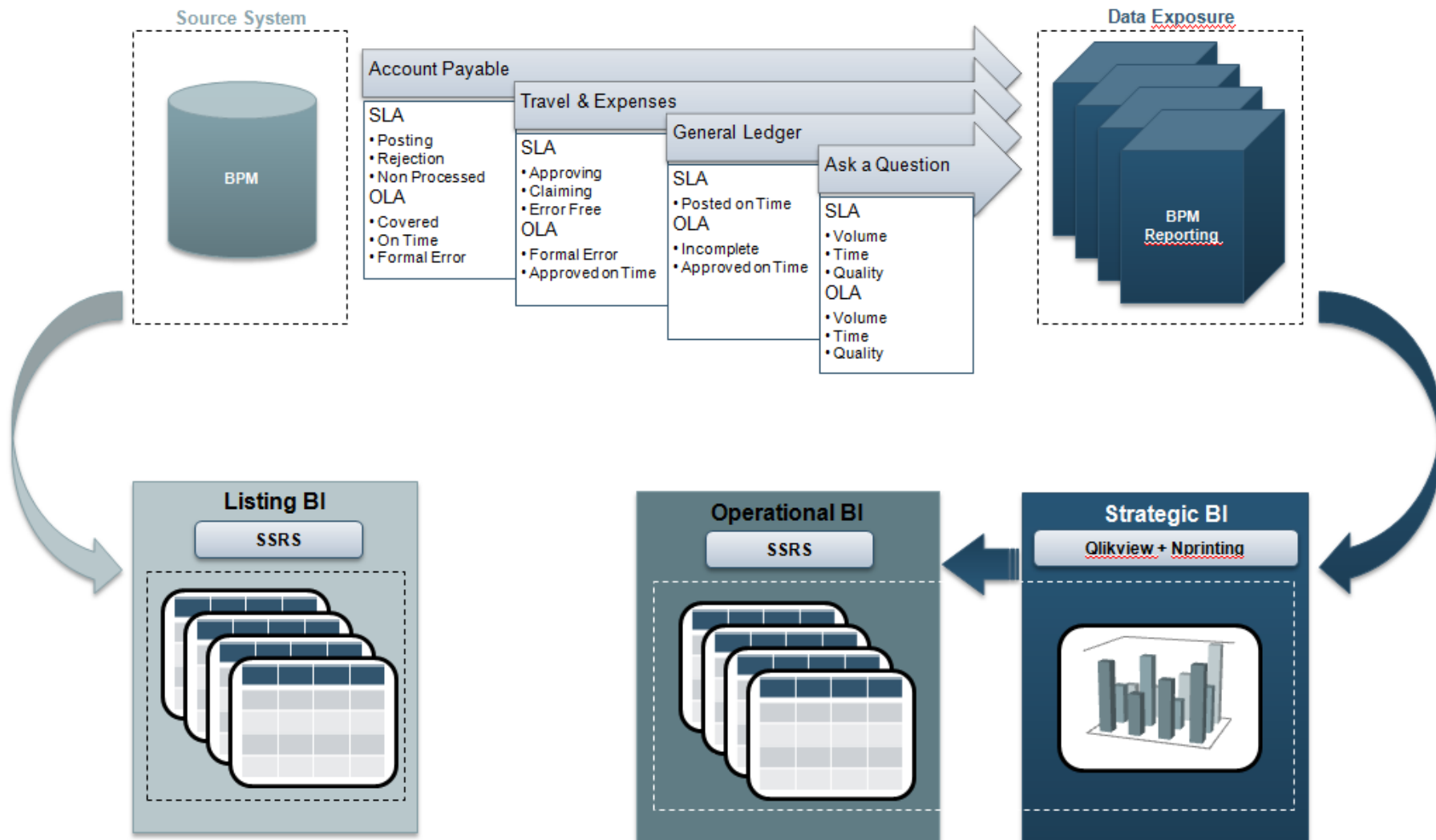
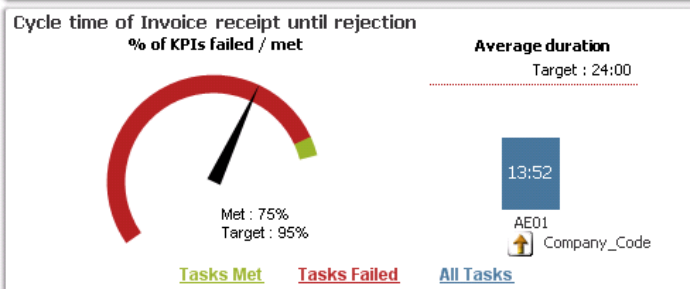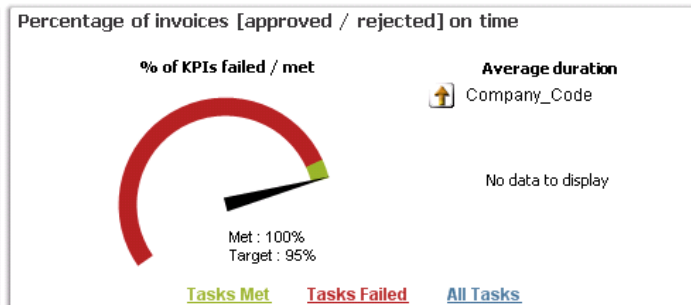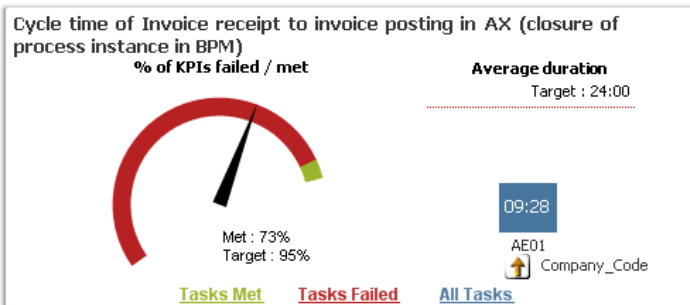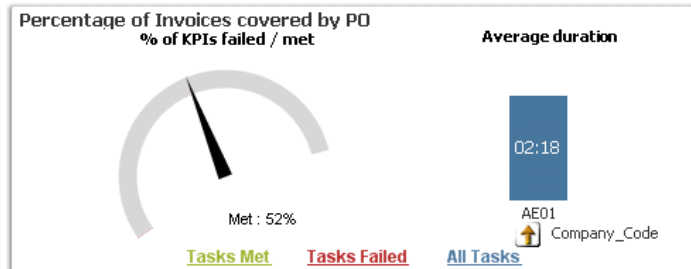**Figure 12 - Data Landscape for the first 4 families of KPI Accounting**

Figure 13 – Layout of the QlikView application KPI Accounting