A case study of the significant differences between Qlik Sense and Tableau

Many believe that Tableau and Qlik Sense are comparable

The truth is – Qlik Sense is very different from Tableau

Qlik Sense offers much more capability as a multi-functional modern BI and Data Analytics platform for everyone!

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A white paper by Rusty Lacy, Qlik Luminary

1) Executive Summary

The purpose of this paper is to document the major differences between Qlik Sense and Tableau. This is because many compare Qlik Sense and Tableau as visualization software tools. However, in this case study based upon 2 Qlik Sense Projects and 1 Tableau project it should be clear that Qlik Sense has much more capability and benefits than Tableau. Basically, Qlik Sense is a modern data analytics platform and Tableau is a traditional BI visualization tool. There is a significant difference between these products and the significant differences will be highlighted in the paper using the 3 projects as actual case studies that highlight these differences. The major differences are how Qlik Sense transforms data into the associative data model and the easy to use visualization tool for business users. It should be noted that projects that have many data sources and many data extracts require 60% to 80% of the labor hours preparing data for visualization. Also, a traditional data model such as a relational data base requires that tables be joined, data be blended, and in some cases a separate database such as a data warehouse or a Tableau optimized database to use the Tableau product effectively. Qlik Sense is very different than Tableau when it comes to data preparation, data transformation, and a data model for visualizations. The major differences are noted below and will be detailed in this paper.

- *Qlik Sense was designed as IN MEMORY application (data is compressed 10-1)*
- *Qlik Sense was designed as an application with one data model*
- *Qlik Sense is a very powerful extract, transform, load (ETL) Tool*
- *Qlik Sense uses an associative data model that is a major time saver that enables rapid time to value*

Tableau is a very good visualization tool. However, it is much more complicated to use because it is really an IT development tool based upon the traditional BI method of sql queries to databases.

2) The Problem with Tableau

Most companies today have many data bases, many data sources, in addition to other data sources such as social media such as Twitter and Google Analytics. Tableau was designed to be a visualization tool and requires a third party ETL tool to deal with complex data sources. Qlik was designed from the beginning with a built in ETL tool to transform data into a significantly different data model called the associative model.

- **What was the most difficult challenge for these 3 projects**? Data was disparate and everywhere and the enterprise data warehouse teams had not met the needs of the business users in all 3

companies! There were multiple data bases, and data needed to be transformed and integrated. Also, there was a need to keep multiple years of data with order details in one case and transaction details in another case that required easy access and analysis.

- **How did Qlik Sense avoid the use of a separate data base and Tableau require that a separate SQL database be created**? In the case of the Tableau project there was a business requirement to analyze 2 – 5 years of transaction detail. This was about 70 million rows of data for the Tableau project. In one of the Qlik Sense projects there was a need to analyze 2-5 years of order line details. In the Tableau project, the only way to meet the transaction detail requirement was to create a SQL database to store the transaction detail records. This was a significant labor effort in addition to the fact that the business unit had no resources to support this database. In the Qlik Sense project, 2 years of order line details was about 179 million rows of data. In this project, there was no need or a separate database. Qlik Sense compresses extracted data to about 1/10 of its size for the purposes of loading the transformed data into memory. Therefore, the Qlik Sense ETL capability to transform data into one data model and the in-memory capability of Qlik Sense meant that there was no need to have a separate SQL database for the order line detail records. This reduced the time to value significantly and reduces the cost to maintain significantly. This is a very important difference between Qlik Sense and Tableau. Qlik Sense has ETL capability designed for one associative data model to be loaded into memory. Tableau has very limited ETL capability with no concept of one data model and required a separate database to be optimized for performance reasons.

- **Why is Tableau more complicated for both IT and the business user than Qlik Sense?** Tableau is a query-based tool that requires data from different tables or data sources to be joined. Qlik Sense is designed to join all data from all data sources into one data model. This reduces complexity for both the technical resources and the business users. The SQL database that was created in the Tableau project created additional work to build and maintain. The transaction detail records had to be transformed and an additional transaction summary had to be built so that Tableau would perform in a reasonable time. Also, there was another table to be built to aggregate some charges to provide suitable performance. The transaction detail records had to be joined with the Accounts Receivable tables to enable various measures to be calculated. This
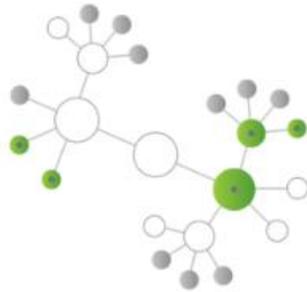
was time consuming and, in some cases, there was data loss due to the join of records with missing data fields. Also, you can only access the data from the query as depicted below:
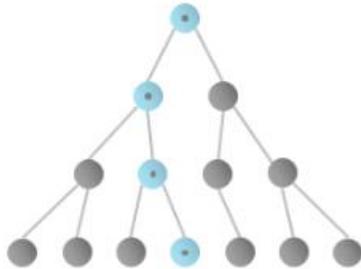
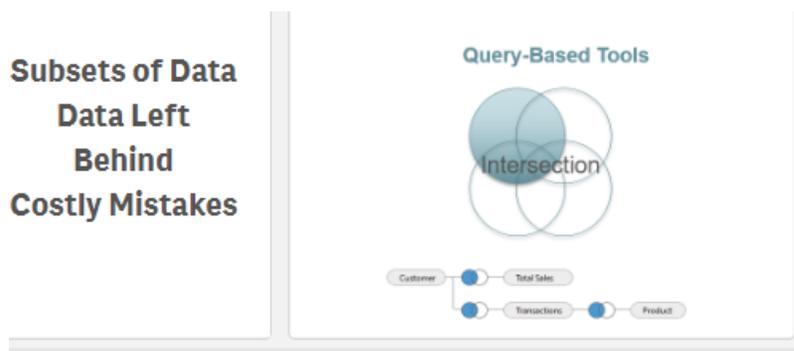By comparison, Qlik Sense enables you to access all the data in your data model as depicted here:

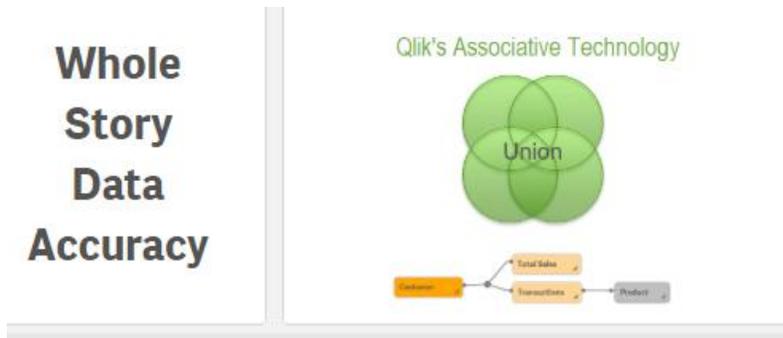Another way to better understand this major difference is to compare the "join tables and queries as you build" approach of Tableau with the Qlik Sense "already done with an outer join of all the data" approach of Qlik Sense as depicted below:

- **What was the impact of this significant technology difference for these projects?** In the Tableau project, there was much complexity added to the project because every requirement that required data from more than one extract or table had to be joined to build the measure in the Tableau dashboard. The transaction detail and the daily update meant the additional software had to be developed to transform the data and join the tables based on the business requirements in the separate Tableau optimized database. In the Qlik Sense project, the daily extracts were performed by Qlik Sense, transformed into the one associative model and loaded directly into memory of the dashboard application! This was a significant reduction in both cost and time to value. The Qlik Sense project was completed in a few months and eliminated the complexity of a separate SQL database and the complexity of custom SQL and table joins to build the dashboards. Also, the cost to maintain was much higher in the Tableau project as the VP of the business unit had to add an additional technical resource to maintain the database for the Tableau solution. In the Qlik Sense project, this approach had already been attempted and could not be accomplished in any reasonable time and cost by the IT department. The final data model with the whole story of all the data is depicted later in the paper. This level of complexity was not feasible with Tableau due to the excessive cost and time required to meet the business requirements.
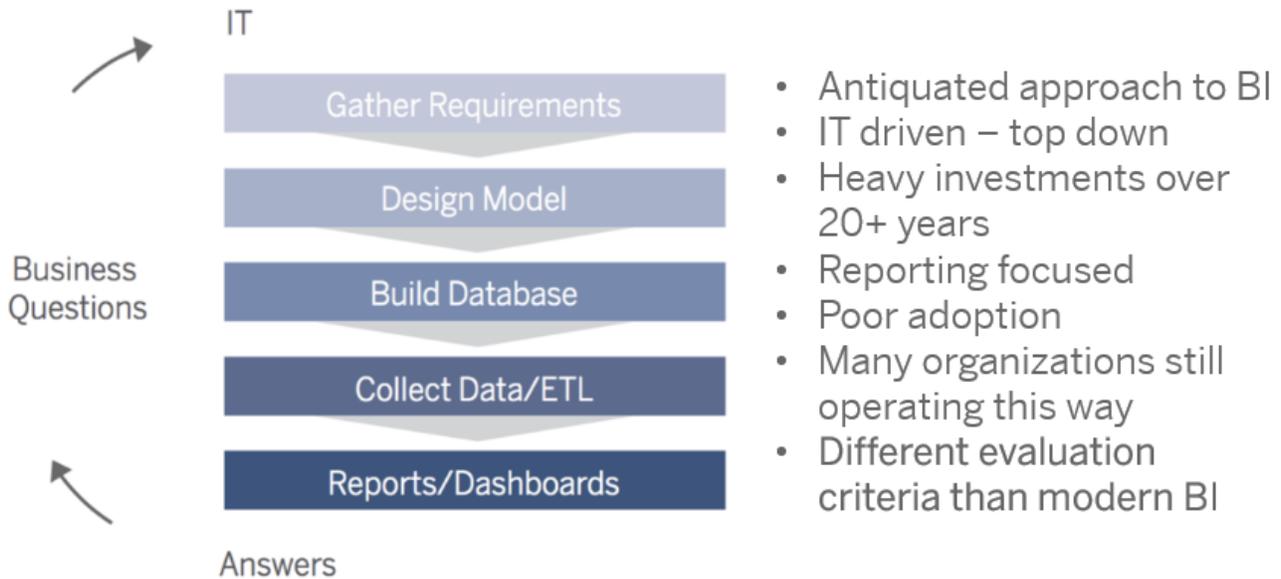
3) The History of Business Intelligence and Qlik and Tableau

- **How is it possible that many people choose Tableau instead of Qlik Sense**?

The traditional business intelligence approach was the standard for all 3 companies and these 3 projects. Each company had a traditional data warehouse. However, this traditional enterprise data warehouse is a very time-consuming approach. In all 3 companies, users wanted to explore all their data from all possible data sources. The current business users did not have the patience for the traditional business intelligence approach. In all 3 cases, the business users knew their data and requirements much better than anyone. However, there was a broken process of separating the business users from their data.

The proven Traditional BI Process separates the ETL Process

Source → Extract → Clean → Conform → Deliver → End User Application / End User Application

Clinical, Billing, Quality ,Technical Resources
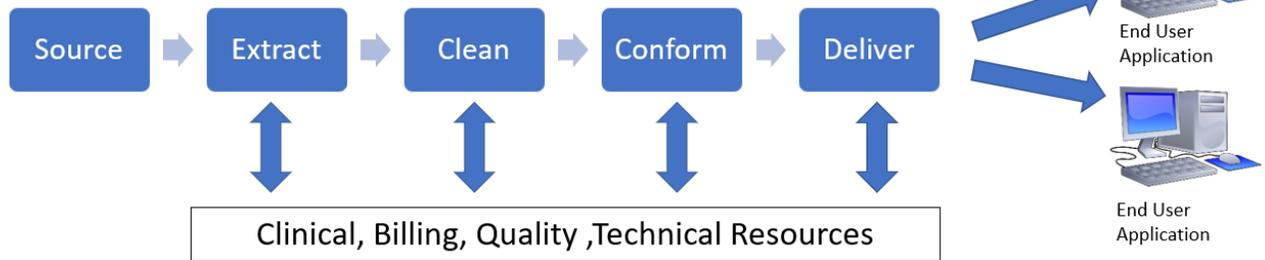
- Tableau is an excellent choice for IT to continue with the traditional BI approach

- Qlik Sense is disruptive since it has an in memory (no database required) design

- Tableau is chosen when IT departments want to continue with the enterprise data warehouse.

- Tableau is chosen when it is compared to Qlik Sense as a visualization tool only.

- Tableau is chosen because some business users and IT users had an experience with Tableau in an institution of higher learning

- Tableau is chosen because the visualizations are what people see and the data model and the ETL tools are not what people see and understand very easily

- In the case of the Tableau project, Tableau was chosen for the enterprise more than 2 years prior and it was supported by the IT department and the BI group. Therefore, Tableau was mandated to the VP of the business unit as the tool of choice to address the business requirements.

- Qlik Sense with an in-memory application with an associative data model that disrupts the current IT approach of an enterprise data warehouse. In the 2 projects with Qlik Sense, it was determined that the estimated time and cost by the BI Teams was an order of magnitude higher for the traditional approach with Tableau and a separated database for Tableau queries. The Qlik Sense technology enabled both projects to succeed in a few months instead of a few years. In both cases, a pilot was conducted by the business users to determine if Qlik Sense really could deliver the time to value and reduced cost. In both cases, Qlik Sense exceeded all expectations of the business users.

4) The Solution to a better understanding

In both of the Qlik Sense projects, a pilot was conducted with Qlik Sense with actual samples of real data. In both cases, the clients decided to use Qlik Sense and develop applications based upon their need to solve a complex business problem. Qlik Sense enabled both organizations to solve the problem that both organizations had attempted with the traditional BI approach of an enterprise data warehouse with star schema data model. In both cases, the IT teams did not solve the problem and provide the business users with a solution to meet their business needs. The reason was that the amount of time and the complexity to build star schemas with a traditional ETL approach led to increased cost and time. In one project, the IT team built a data warehouse with only partial data and it had data integrity issues.

In the other case, it simply took years of labor and the business could not function with corporate directives because it could not get timely access to information needed to address the business problems. In the case of the Tableau project, the enterprise data warehouse team could not solve the problem either. In all these cases, the IT team was still attempting to integrate multiple data sources with a traditional data warehouse, traditional ETL, and star schema data models. There was simply too much data preparation required and too much time and too much money.

Gartner View of Modern BI vs Traditional BI

Analytical Workflow Component	Traditional BI	Modern BI
DATA SOURCE	Up Front Dimensional Modelling (IT Built STAR SCHEMA)	Up Front Modelling not required (Flat Files and Flat Tables)
DATA Ingestion and Preparation	IT Produced	IT Enabled
Content Authoring	Primarily IT Staff but some power Users	Business Users
Analysis	Pre-Defined. Ad Hoc Reporting based upon Pre-Defined Data Model	Free Form Exploration
Insight Delivery	Distribution and Reports via scheduled reports or Portal	Sharing and Collarboration, Storytelling, Open APIs

The Tableau project required a third party ETL tool to prepare the data. Both Qlik Sense projects leveraged the ETL capability of Qlik Sense. In both Qlik Sense projects, the amount of time to build

visualizations was reduced so much that both organization executives were amazed. This was mainly achieved for these reasons: (1) Powerful ETL capability of Qlik Sense (2) Qlik Sense associative data model and (3) Qlik Sense Data Discovery approach. There was no need to document requirements in detail for the Qlik Sense projects. In the Tableau project, there was 2 weeks and 240 labor hours consumed just documenting requirements and the identification of data sources.
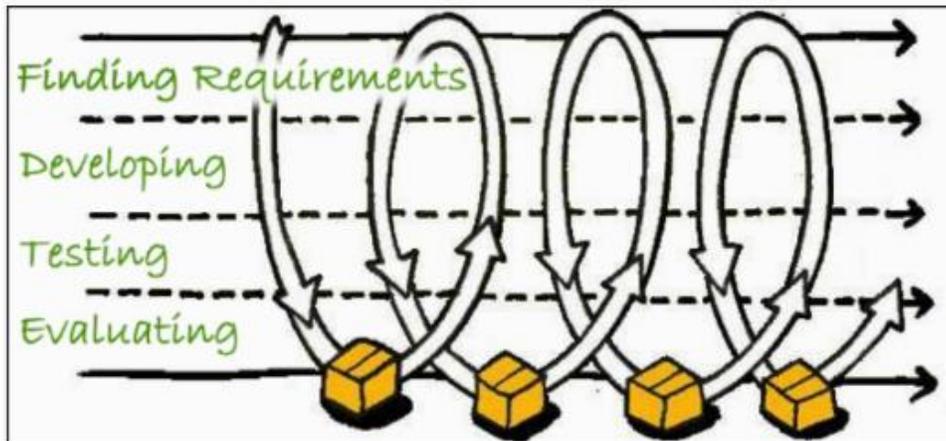
The iterative development process

This Qlik Sense Data Discovery approach uses an iterative development process that enabled the business users to find their important business requirements. In both Qlik Sense projects, the business users discovered the truth about their business with the reality of their business data. Some business users and vice presidents simply did not know what they really needed until they participated in this iterative process to visualize their data. This is in stark contrast to the Tableau project. The Tableau project required a great deal of time to build a SQL data base to store 70 million transaction detail records. Also, the other data sources were extracted and stored in the data base. There was no choice but to document requirements and build the data base for the Tableau project. Tableau experts clearly stated that Tableau could not provide any acceptable performance with the business requirements of this business unit.

ETL to the End User is an integrated , agile process for user requirements , executive dashboards and involves everyone

Tableau data models require **an extraordinary amount of time** and must **be built based** upon **well understood business requirements**. The Qlik Sense data model extracts **all the data** from all the data sources and associates all the data into **one data model.** This allowed all business users to explore **all the data** in one place. The Qlik Sense associative model eliminated the need **for pre- built IT data modelling** such as star schemas, summary tables, pre-built calculations required in the Tableau project. Business users were able to explore all the data and get the whole story of their data. This was **only possible** with the modern technology of **QLIK Sense** and the associative data model for all the company data! This retail food chain had 19 different data sources that were extracted and transformed into one data model as depicted below. This simply could not be done with Tableau and the traditional approach and the requirement to pre-build most of the required key performance indicators. The retail food chain team had already attempted this in their enterprise data warehouse. In the retail food project, there is one data model that has retail store data, store geocoded data, drive times, boundary lines, store inventory, store order headers, store order lines, corporate inventory, a special period calendar of 364 days per year for period comparisons, weather data and much more in one data model for data exploration by all business departments.
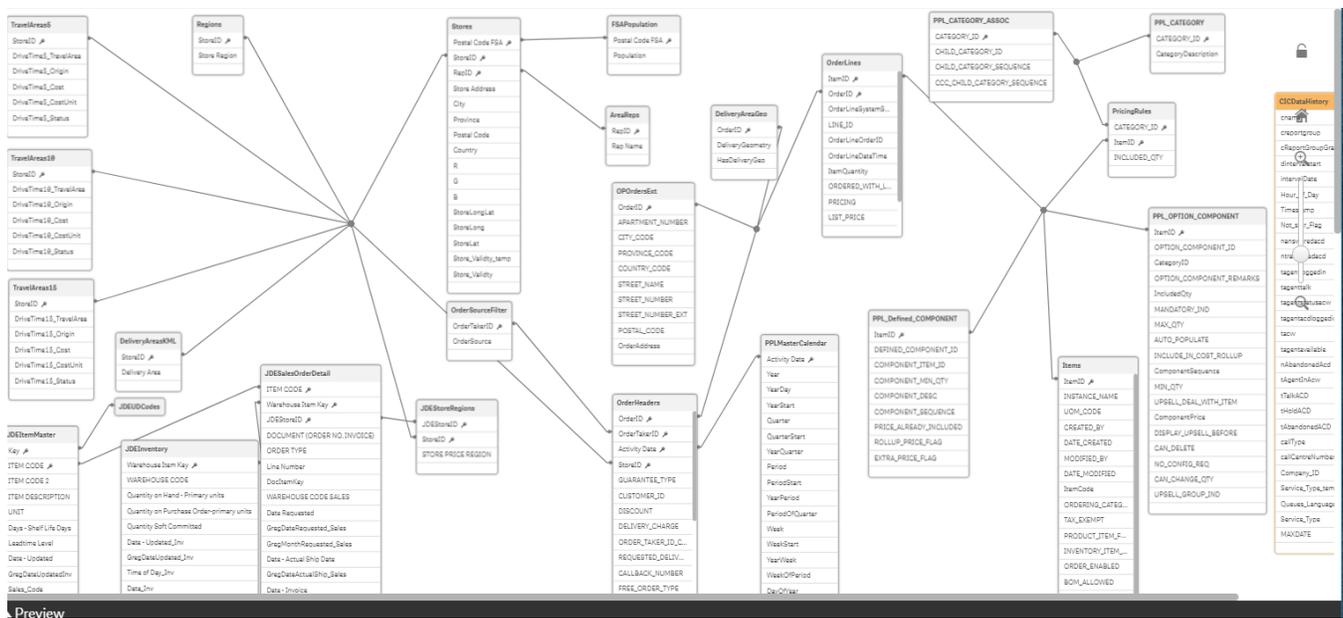
5) The Benefits of Qlik Sense as compared to Tableau

The important benefit to this methodology and technology is significantly modern and different:

- Both Qlik Sense projects really did facilitate business users to own the solution instead of the IT department. This really does increase adoption of the solution, improve the accuracy of the measures, and enable future development of future measures and KPIs.

- Qlik Sense enabled the business users and key people in the business units to develop their own dashboards for analysis in the future. One of companies is currently using Qlik Sense to train business users in business departments to build their own dashboards with Qlik Sense. This is because the Qlik Sense data model was very understandable for both IT and the business users. Every field of every table in the data model can be made available to any business user to meet current and future business needs.

- The business users were able to explore all the data without the need to request that the IT department to build a KPI. This is because of Qlik Sense and the associative data model that already has all the data in the data model effectively associated into one data model for business exploration. This is a unique capability of Qlik Sense. Tableau has no such concept. In the case of the Tableau project, a database to store 2 years of data was needed because there was a business need of 2-5 years of history in addition to the daily updates of transaction detail. In the Qlik Sense project that required 2-5 years of data, 179,000,000 rows of data were compressed and loaded

into memory as part of the Qlik associative data model. This eliminated the need to have a separate SQL database to store the details. Therefore, complexity was reduced, and many hours of labor were avoided because Qlik Sense has this capability. There was no need to add an additional resource to operate and maintain a separate database as there was in the Tableau project.

- Qlik Sense reduces complexity of data management and visualization creation as compared to Tableau. This is because of the associative data model, built in ETL capability, and the simplicity of the user interface of Qlik Sense. In both Qlik Sense projects, the cost reduction of hours to meet business requirements was in the range of 50-90%. In one of the Qlik Sense projects, the departmental super users were trained as Qlik Sense business analyst to reduce the dependence upon the IT department. This is a very significant difference between Qlik Sense and Tableau.

- Here are some of the important benefits for both Qlik Sense projects.

    a. Data Integrity

    b. One data model that all business users can understand more easily

    c. Rapid Time to Value (months instead of years in the two Qlik Sense projects)

    d. Ability to explore all the data in one data model

    e. Ability for business users to build and maintain their own dashboards and visualizations

    f. Reduced cost to build by 50 to 75%

    g. Reduced cost to maintain by 50 to 75%

    h. Ability to have intraday insights into the business operations

- Here is a summary of the actual detailed results of the 2 Qlik Sense projects:

    ### Retail Food Chain Project with Qlik Sense

    - Rapid Time to Value delivered in 90 days from 19 different Data Bases to a complicated 27 Table Data Model!

    - **The Enterprise Data Warehouse had data integrity issues. CEO and Sales needed accurate insights that were delivered with Qlik Sense Associative Engine.**

    - **Delivered accurate data daily and needed 2-5 years of data with order line details.**

    - **Developed and automated 50 ETL (extract, transform, load) programs to one final data model**

- **Developed intraday (every 15 minutes) update to Sales Dashboard (live ETL for Intraday sales)**

- **Loaded ESRI Shape Files for demographic data, store territory and drive times for each store using Qlik GeoAnalytics**

- **Created Daily Updates from Twitter including sentiments and Google Analytics implemented in Qlik Sense Dashboards**

- **Weather Data Analysis implemented for each store using Qlik Data Market Weather**

- **Store Inventories, Call Center Activity, and Corporate Inventory from JD Edwards implemented in one Data Model that reduced many manhours to build and maintain by 75%-80%.**

- **Reproduced identical ETL programs and this Data Model with another retail food chain with different databases and legal entities for this retail food chain in a matter of days.**

- **Implemented a complicated 364 days per year Calendar with client specific reporting periods**

- **Modern BI Data Model enabled the rapid time to value. Traditional BI did not solve the problem with the enterprise data warehouse due to the complexity of the datasets and data model.**

Regional Hospital Chain Project with Qlik Sense

o Sprint 1 delivered in 90 days for Supply Chain, Revenue Cycle, and Labor Productivity applications.

o **Sprint 1 close out with CEO, CFO and VPs resulted in each VP executing his own demo to the CEO. This is good example of VP level ownership due to the integrated ETL process**

o Sprint 2 – CEO requested Surgery Analytics, VP of HR –requested People Dashboard, and CFO requested adding pharmacy Data to Supply Chain applications due to the rapid time to value

o **Revenue Cycle has 50 data sources, Supply Chain has 170+ data extracts, Labor Productivity 6 sources, People Analytics based upon WorkDay and Taleo and Surgery**

Analytics based upon EPIC data. This simply is not feasible with Tableau and the required ETL labor hours

- Surgery Analytics automated ETL directly from the EMR for the VP of Surgery Operations for critical KPIs for operations and performance improvement- CETL (Connect, Extract, Transform, Load)- Tableau Server simply does not support event driven extracts.

o VP of Surgery Operations was able get truth of Case Volumes, OR Room Utilization by Location, Room in 1 month due to the Qlik Associated Data Model reduced labor hours for 15 Epic Extracts.

o The level of complexity with these data sources was only possible with Qlik Sense and the associative data model. Tableau and the traditional data models required an order of magnitude more effort.

o Healthcare Solutions developed as business applications

- Supply Chain Analytics, Revenue Cycle Analytics, Labor Productivity for all hospitals and data sources
- Surgery Analytics, HR People Analytics for Epic hospitals and associated data sources

o VP of Supply Chain stated: "This Supply Chain solution done in 3 months would have taken years for our enterprise data warehouse team".

Qlik Sense vs Tableau - Another Case Study for Everyone

- Should you investigate the reality of this technology and methodology? There is simply no down side to conducing an evaluation with your data using a data discovery approach with Qlik Sense. This is a proven technology and methodology that you should consider for the future.
- How does Qlik Sense really compare to Tableau? This table below provides a summary of the significant differences between Qlik Sense and Tableau based upon the case study of these 3 projects:

+ Qlik +		vs.	- Tableau -	
Item	**Importance**		**Item**	**Importance**
Application			Dashboard	
One Data Model			Query Based	
Associative Model			Traditional SQL	
ETL Tool			NO ETL Tool	
Integrated ETL Process			Broken ETL Process	
NO need for Joins for KPIs			Must Join Tables sometimes	
NO need-Data Blending for KPIs			Must Blend Data sometimes	
In Memory Application			Based upon live connections	
No Data Base Required			DB Required for Sizeable Details	
No Pre-Built Summary Table Req			Performance Requires pre-build	
No Pre-Built Calculations Req			Performance requires pre-build	
No Separate Mobile App			Separate Build for Mobile	
Cognitive Engine			No Cognitive Engine	
Modern BI			Traditional BI	

6) The Call-To-Action for an organization with Tableau

If your organization has an existing data warehouse, you should consider a pilot with Qlik Sense.

If your organization is currently using Tableau, you should still explore the reality of the modern Data analytics approach with Qlik Sense Enterprise.

There is really no need to be limited to one vendor such as Tableau. Why not consider the future with multiple vendors? Why limit yourself to just one?

- Your IT department has declared a standard based upon Tableau. What should you do? Start a proof of concept with QLIK SENSE immediately!

- Tableau customer should conduct a true proof of concept with Qlik Sense and discovery a better way forward for everyone! Every IT department should enable all their business users to build their own dashboards with Qlik Sense! The degree of difficulty for business users to build their own dashboards with Tableau is very high when compared to Qlik Sense.

- One of these Qlik Sense projects conducted a complete proof of concept with Qlik Sense to determine the reality of potential benefits for the business. Discover what this retail food chain did. The best way forward was not Tableau but Qlik Sense Enterprise! Explore your own data with your own pilot project and discover for yourself.

7) About this Modern Data Analytics Solution Qlik Sense Enterprise

In these Qlik Sense projects , "*Modern Methodology (Data Discovery)"* was enabled by *"Modern Technology (Qlik Sense)"* and delivered a modern solution for now and the future.

Qlik Sense vs Tableau - Another Case Study for Everyone

- One Data Model
- All Data Joined
- ETL Tool(Qlik)
- Data Visualization
- Data Integrity
- Data Governance

- Reduced labor
- Data What Ifs
- GeoAnalytics
- Weather Data
- Twitter Analytics
- Google Analytics

- Data Discovery Approach
- Future Business User Developers
- Modern Data Model
- Rapid Time to Value
- Lower Cost of Ownership