Ruxley Towers, UK

Best Practice in Cloud Services from Database Answers

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barryw@databaseanswers.org

1.Management Summary

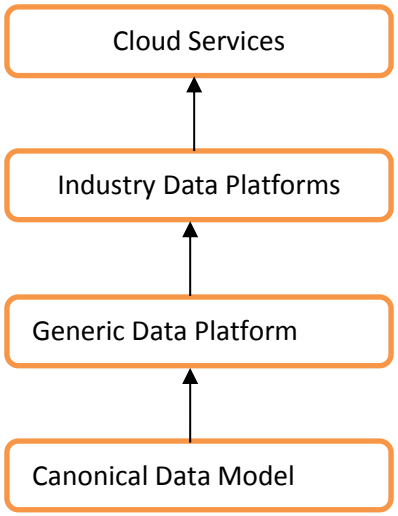
This document is full of diagrams and can be read in less than 10 minutes.

1.1 Reference Data Architecture

Our Reference Data Architecture is shown on our Database Answers Web Site :-

- http://www.databaseanswers.org/reference_data_architecture.htm

We use the Architecture to guide our thinking and help us with common points of reference.



1.2 Benefits of this Approach

The benefits are that a common design Approach is used to support a wide variety of Industry specific Azure Services application.

This will appeal to Microsoft and Microsoft Partners because time spent becoming familiar with the Approach will support marketing to a wide range of end-users.

2.Cloud Services

2.1 What are they ?

Cloud Services can be defined as a conceptual IT Delivery system with no concern of hardware, software or operating system.

Wikipedia does not offer an entry for Cloud Services.

The nearest it suggests is Cloud Computing Service Models :-

- https://en.wikipedia.org/wiki/Cloud_computing#Service_models

We define Cloud Services as a "Conceptual IT Delivery system with no concern of hardware, software or operating system".

In other words, a User-oriented Business View such as Banking, Insurance, Retail and Travel.

- Event-Driven Platform
  http://www.databaseanswers.org/data_models/event_driven_platform/index.htm

2.2 Why are they important ?

They are important because they represent a convenient way to think about the users and their interaction with IT Services.

In addition, we can combine this with a Model-View-Controller which is a well-established Application Architecture to provide a common framework for our Services.

This provides us with a very powerful approach to discussing Cloud Services.

2.3 What will I learn ?

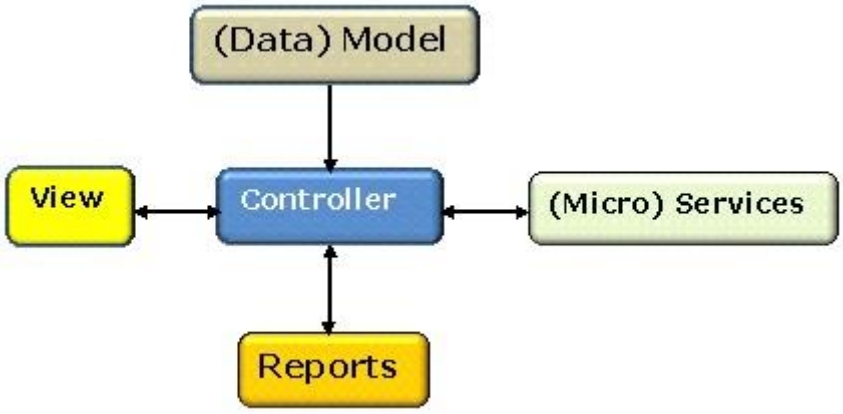
You will learn about a Model-View-Controller and how it can be the foundation for a Cloud Services Architecture.

2.4 Best Practice

This provides us with a very powerful that we show on our Database Answers Web site :-

- http://www.databaseanswers.org/data_models/mvc_model_view_controller/index.htm

which looks like this :-



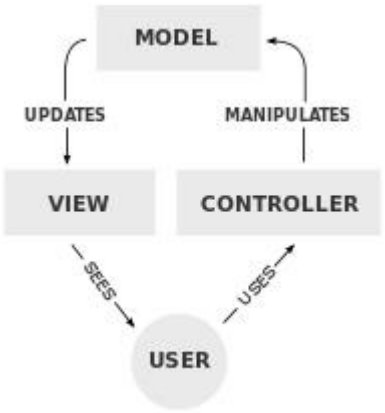
This is where we run our operational Services based on our generic design based on our Canonical Data Model and Industry-specific Platforms.
Here we show three for illustration.

2.5 Model-View-Controller

We like the M-V-C as the Framework for our Solutions Architecture.
The Wikipedia version is on this page :-

- https://en.wikipedia.org/wiki/Model%E2%80%93view%E2%80%93controller

and looks like this :-



Our version is on the page :-

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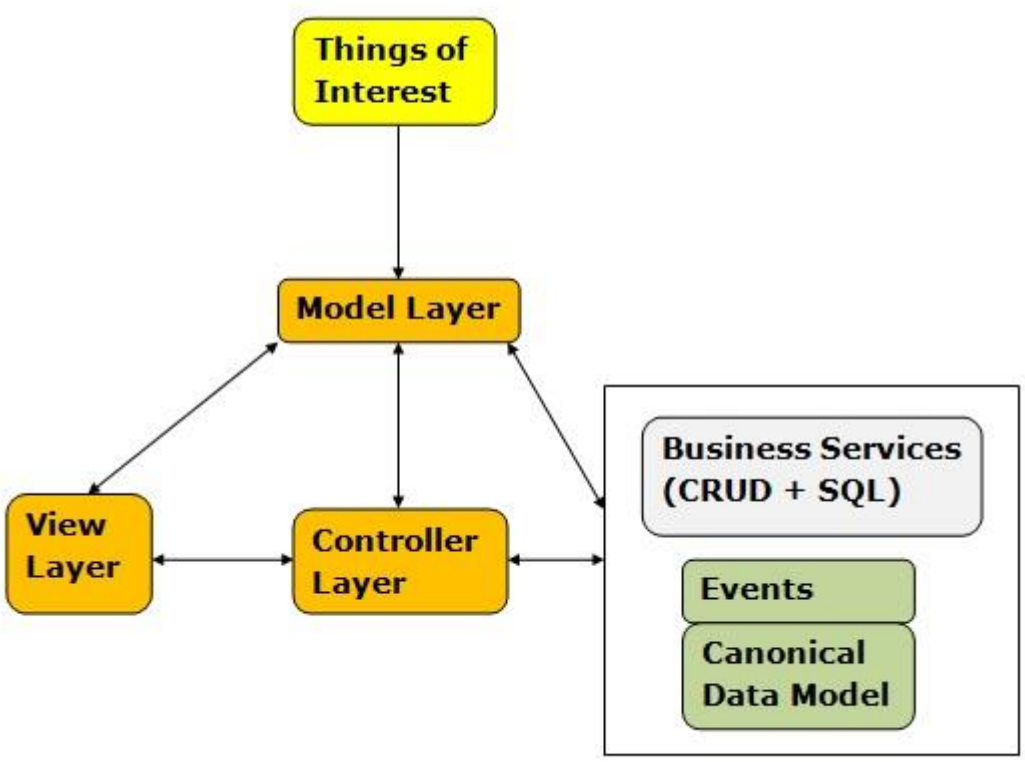


Wikipedia describes the three Components (MVC) in these terms :-

1. The *model* is the central component of the pattern. It expresses the application's behavior in terms of the problem, independent of the user interface.
   It directly manages the data, logic and rules of the application.
2. A *view* can be any output representation of information, such as a chart or a diagram. Multiple views of the same information are possible, such as a bar chart for management and a tabular view for accountants.
3. The *controller*, accepts input and converts it to commands for the model or view

3. Our Industry Data Platforms

Here is our Canonical Data Model that provides the foundation for our Data Architecture :-

- http://www.databaseanswers.org/data_models/canonical_data_models/index.htm

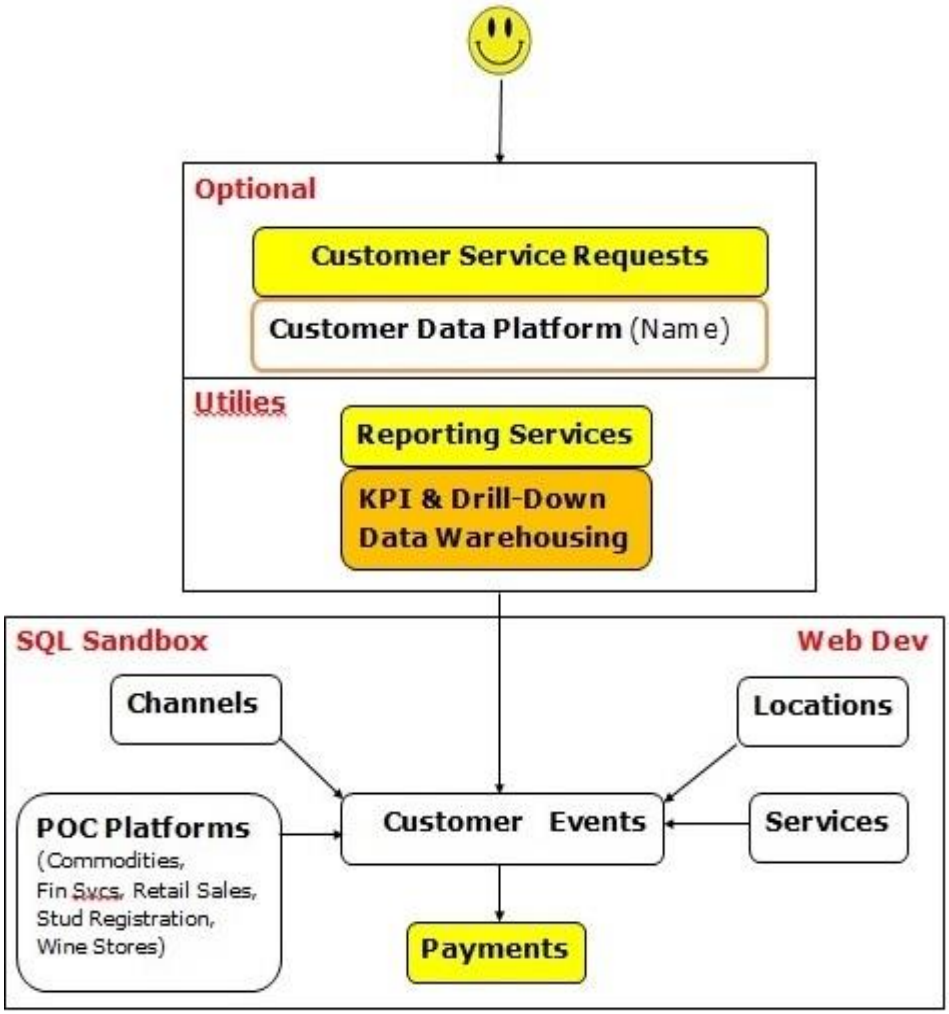
Here is what it looks like that demonstrates the fundamental design of Layers :-

3.1 Financial Services

Our Financial Services Platform is on this page :-

- http://www.databaseanswers.org/data_models/financial_services_platform/index.htm

and looks like this :-

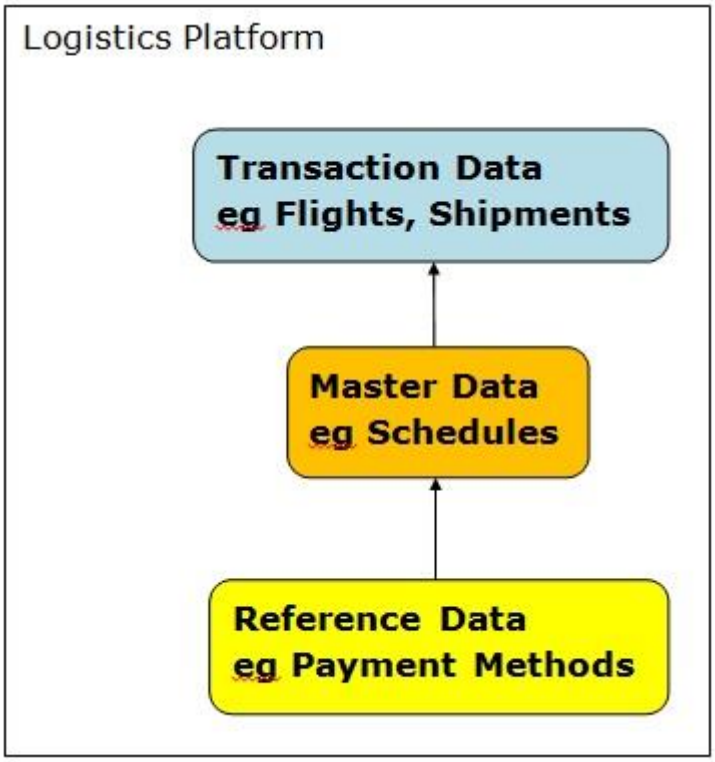


3.2 Logistics

Our Platform is on this page :-

- http://www.databaseanswers.org/data_models/logistics_platform/index.htm

and looks like this :-

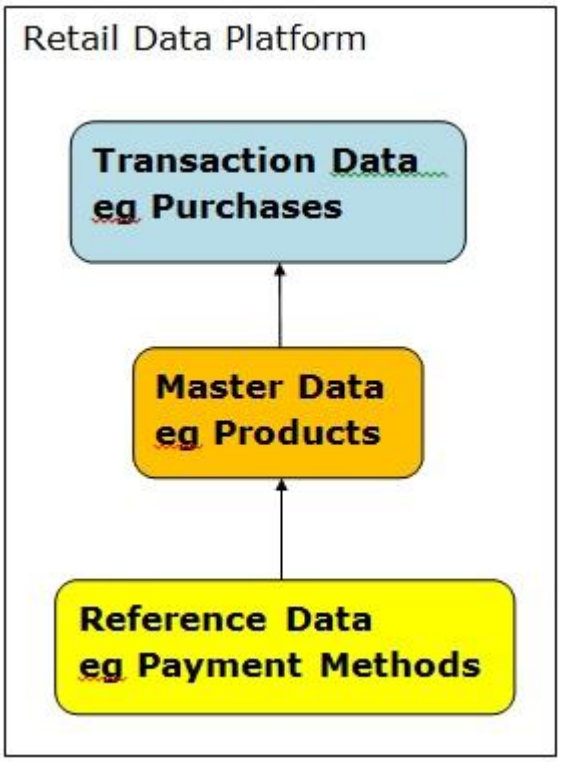


3.3 Retail Sales

Our Retail Data Platform is on this page :-

- http://www.databaseanswers.org/data_models/retail_data_platform/index.htm

and looks like this



4. Commercial Platforms

4.1 Liaison Alloy Platform

Here are some quotes from the Liaison Web Site :-

"Conceived from the ground up to address today's technology disruptors, ALLOY is a next generation cloud platform for solving today's integration and data management challenges.

- **ALLOY provides** unified integration and data management capabilities as managed services, buffering the complexities of increasing data volume and variety
- **ALLOY connects** any two application end points: cloud, mobile, device, on-premises, etc.
- **ALLOY persists** data in a big data repository, providing on-demand, self-service access to clean, quality data
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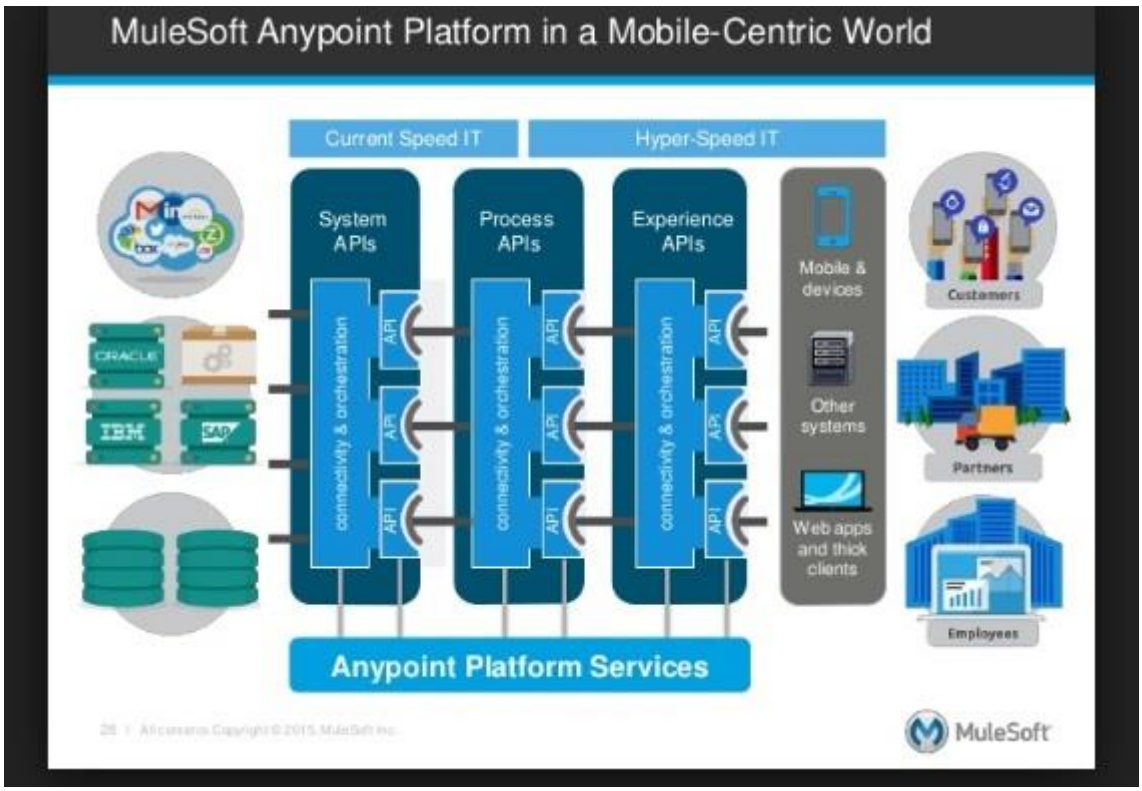
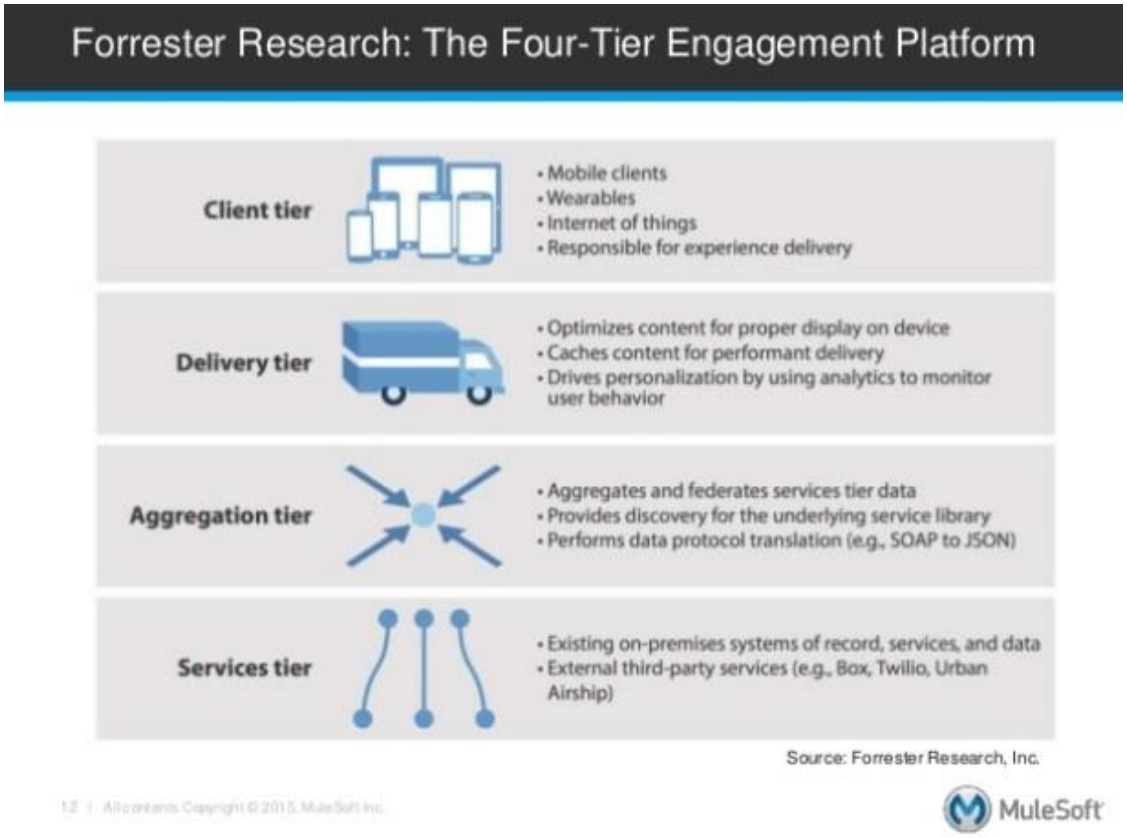
- https://www.liaison.com/liaison-alloy-platform
- http://www.idevnews.com/stories/6515/Liaison-Alloy-Platform-Redefines-Integration-and-Data-Management

4.2 Mulesoft

4.2.1 Mulesoft's Anypoint Platform



4.2.3 Mulesoft and Forrester



4.3 Salesforce

4.3.1 Salesforce Cloud Platform

- http://focusonforce.com/platform/salesforce-platform-overview/

4.3.2 Salesforce and Events

On this page :-

- https://www.slideshare.net/salesforcefoundation/georgetown-university-and-st-norbert-college-improving-recruiting-efficiency-webinar

We like this slide because it combines the words Platform and event.

4.4 SAP and Google (Kronva)

They have a Netweaver Platform on this page :-

- http://www.kronva.com/

4.5 Software AG

Digital Business Platform for SAP :-

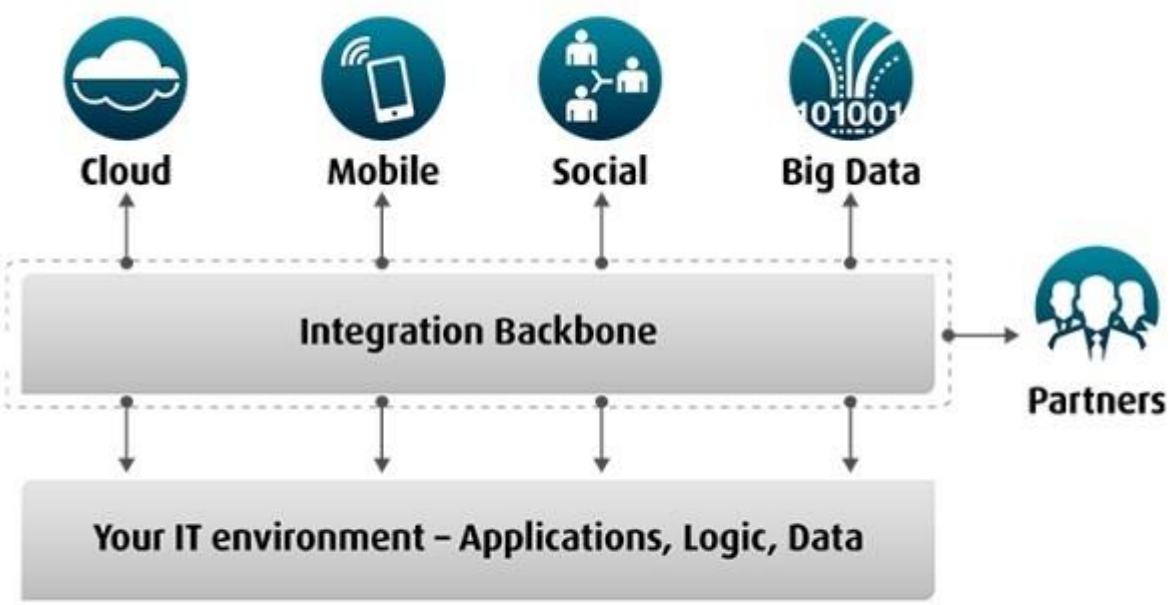
- https://marketplace.softwareag.com/apps/48105#!features/SAP_process_design

Claims and Policy Management for Insurance :-

- https://marketplace.softwareag.com/apps/37895#!overview

Here is their DBP Integration Platform or Webmethods Integration Platform on this page :-

- http://www2.softwareag.com/corporate/products/webmethods_integration/integration/default.aspx

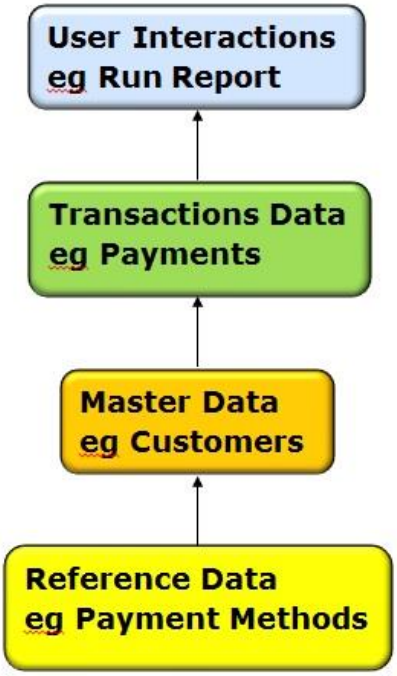


5. Generic Data Platform

Here is our Model :-

- http://www.databaseanswers.org/data_models/canonical_data_models/index.htm

Here is what it looks like that demonstrates the fundamental design of Layers :-

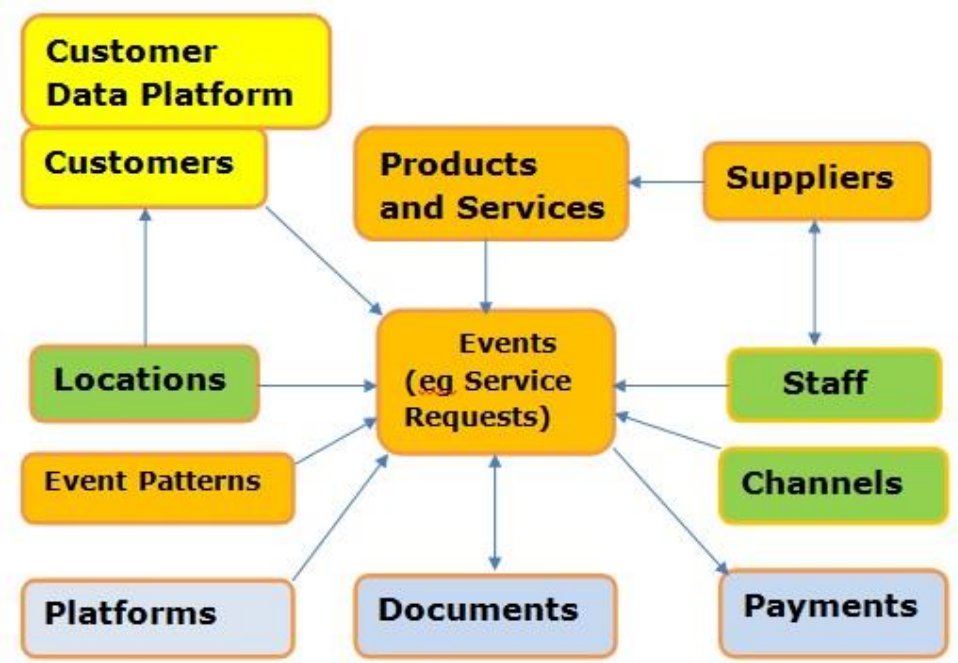


6. Canonical Data Model

This is discussed in this page of my Database Answers Web Site :-

- http://www.databaseanswers.org/data_models/canonical_data_models/index.htm

And here is what it looks like :-

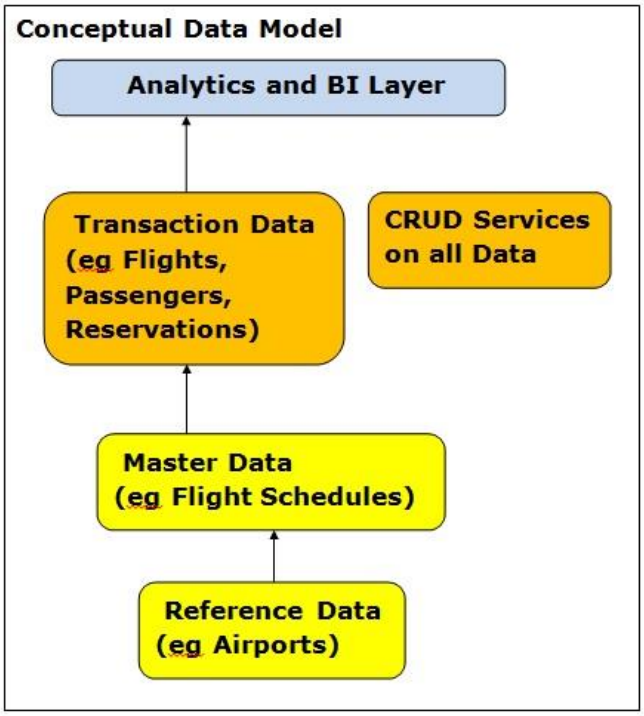


7. Our Industry Platforms

The term 'Platform' is commonly used but without an exact definition of its meaning, and our Data Platforms are defined as simply having many Layers of different kinds of Data.

7.1 Airport Management

- http://www.databaseanswers.org/data_models/airport_mgt_platform/index.htm



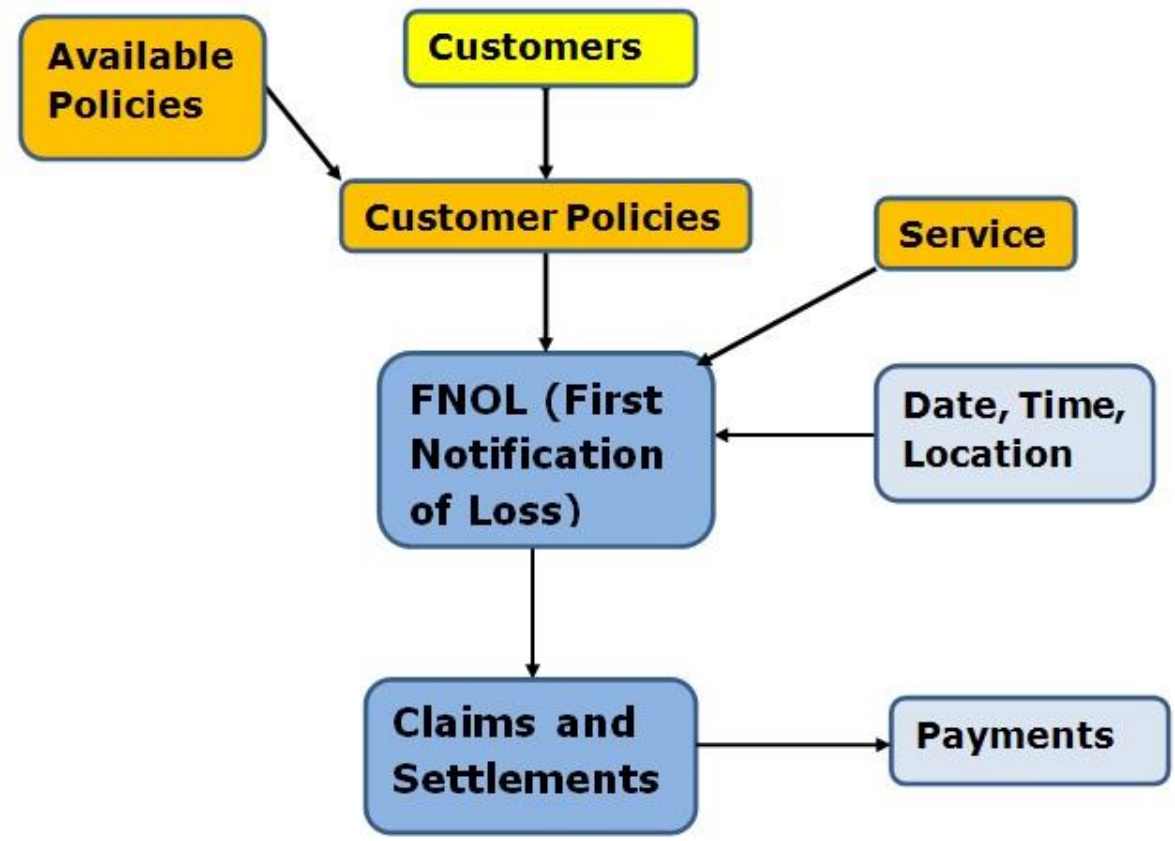
7.2 Insurance (FNOL)

FNOL is standard Insurance industry terminology for 'First Notification of Loss' and it means the data that a specific Customer has to provide as part of the first time a claim is made.

The Data Model is on this page :-

- http://www.databaseanswers.org/data_models/insurance_fnol/index.htm

And looks like this :-



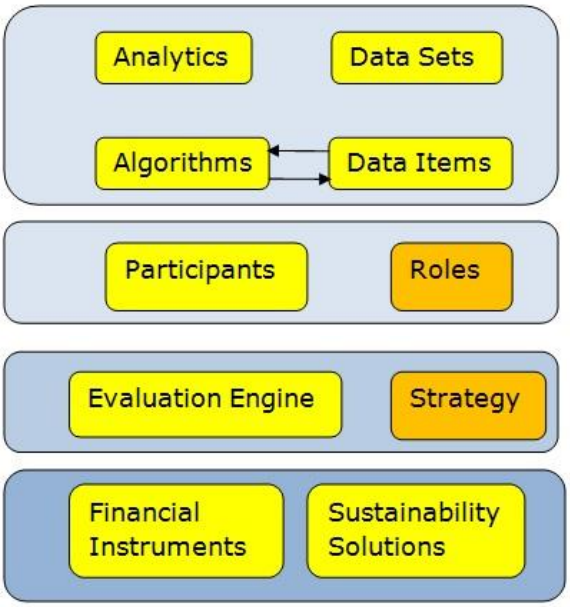
7.3 United Nations

The UN Global Compact is a UN initiative to encourage business support of the UN activities and objectives.
We have been members since 2002 and here is a link to our Letter of Appreciation from the UN :-

- http://www.databaseanswers.org/letters/un_letter.htm

Here is the Web Link to our UN Platform :-

- http://www.databaseanswers.org/data_models/un_global_compact_platforms_for_2017/index.htm



8. Data Integration Platforms

8.1 What is it ?

Data Integration is the process of producing one stream of related data from a number of streams of data from different sources.

For example, Customer data can be obtained from retail purchases and telephone bills.

The key activity involves matching data for the same Customer from different streams.

In the case of Customers, this can be achieved by matching facts about a Customer such as names, addresses, gender and data of birth.

8.2 Why is it important ?

It is it important because it provides a 'Single View of the Truth'

8.3 What will I learn ?

You will learn how to match data using appropriate external standards.

For external, in the UK, the Government maintains a so-called 'Post Office Address Format' or PAF-File and commercial software is available to simplify the matching process.

8.4 Best Practice

This page on our Database Answers Web Site is a good starting point :-

- http://www.databaseanswers.org/enterprise_data_integration.htm

8.5 Templates

This page on the IBM Web Site is a useful introduction to the more general topic of Master Data Management :-

- http://www.ibm.com/analytics/us/en/technology/master-data-management/

8.6 FAQs

This page has some very useful links to help you get started on Customer Data Integration:-

- http://www.databaseanswers.org/customer_data_integration.htm

Here is a useful set of links for commercial De-Duping software :-

- http://www.databaseanswers.org/deduping.htm

8.7 ETL – Extract, Transform and Load

ETL is a very important component of the Integration Platform.

This Wikipedia entry is a very useful introduction:-

- https://en.wikipedia.org/wiki/Extract,_transform,_load

The function of ETL is to take data from multiple sources, clean it up and transform it so that it can be loaded into a Data Warehouse.

It might include providing a 'Single View of the Truth', so that, for example, a Customer called John could be recognised as Johnny, Jon or Jonno.

It is common to find Libraries of Transformation Utilities being used that reflect corporate standards, such as closing Dates for Sales Orders.

8.8 Some Commercial Platforms

8.8.1 Liaison Alloy Platform

Here are some quotes from the Liaison Web Site :-

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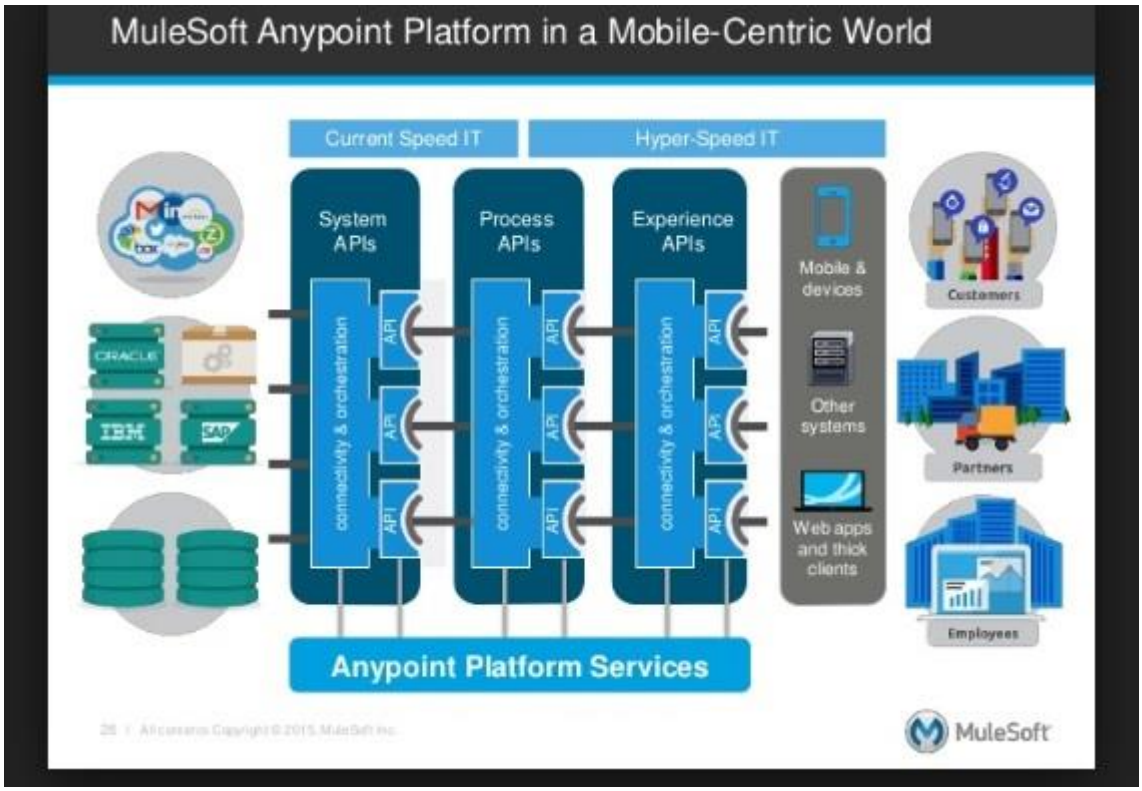

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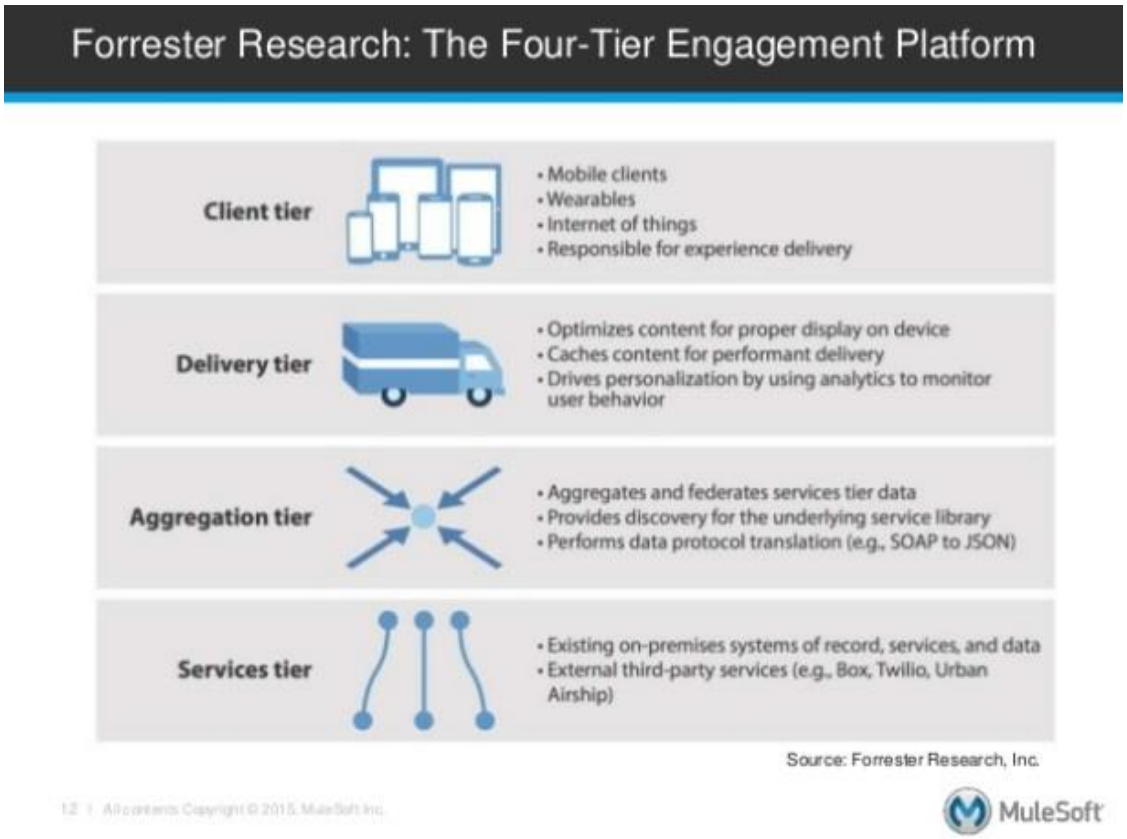

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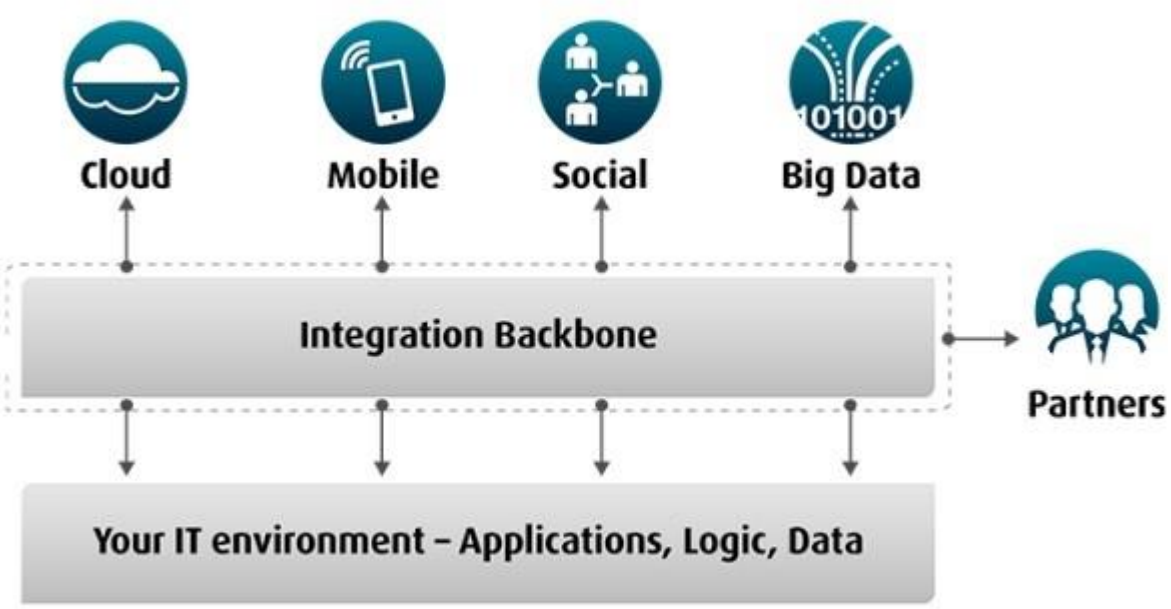


9. Generic Platform

There are three Components that apply to any Data Management activity :-

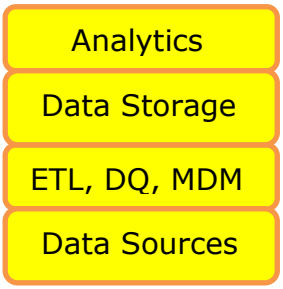
10. Universal Data Platform

10.1 Our Vision

This is shown on this page of our Web Site :-

- http://www.databaseanswers.org/data_models/Vision_of_Universal_Data_Platform/index.htm

It conforms to our three-layer Platform that we show here :



10.2 Amazon AWS

This Platform is on this page :-

- https://www.slideshare.net/RevistaSG/quin-es-amazon-web-services

The four column headings correspond to our Layers of :-

1 Analyse – is our Analyse
2 Store - is our Data Warehouse
3 Orchestrate is included in our Data gathering
4 Collect (and AWS Database Migration Service) – is our Data Gathering

10.3 IBM

IBM has interesting diagram on its Web Site :-

- https://www-01.ibm.com/software/id/data/bigdata/enterprise.html

When we contrast this design with our Generic Data Architecture we can see that :-

1) The 'Analytical Applications' Layer corresponds to our top-most 'Analysis' Layer
2) The 'IBM Big Data Platform' consists of 4 Layers which include our Data Sources (including Hadoop and Stream) and it includes a Data Warehouse which could be an intermediate source of input data and output data.
3) In addition, it shows the lowest layer of Information Integration & Governance.
   This is not a match to our Architecture and does not fit comfortably.

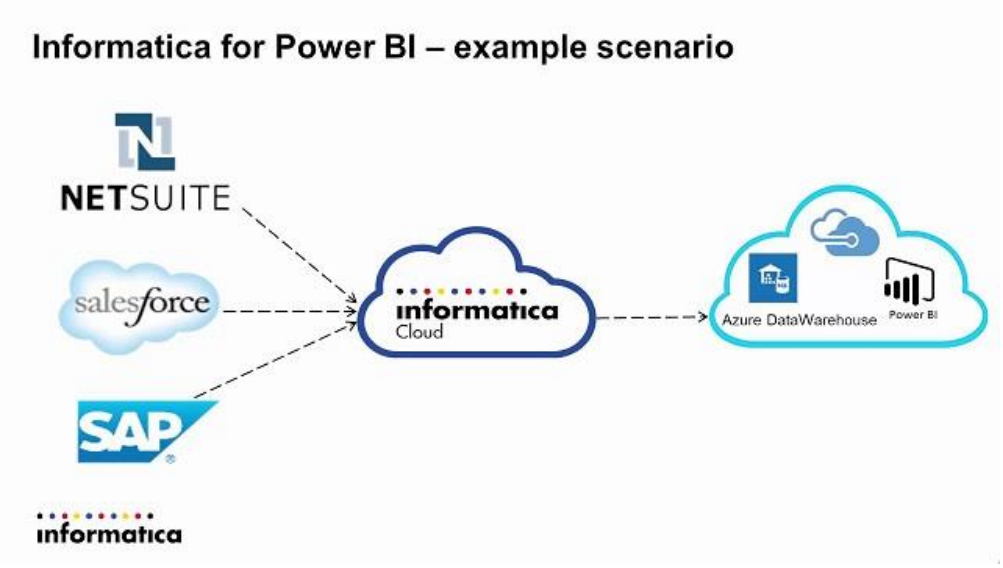
10.4 Informatica

This is a slide from an Informatica Youtube presentation showing how Informatica can act as a middle tier for loading data into a Microsoft Azure Data Warehouse in the Clouds.

- https://www.youtube.com/watch?v=ETEPyTsqViM

The 'Cloud' on the right shows the Data Storage layer.

The Layer on the left shows the Data sources and the Informatica Layer in the middle shows where all the 'heavy lifting' is done of ETL, DQ, MDM and so on.



10.5 Google

This shows Google Analytics as an example of how the published Architecture is another example of my three layer Platform.
It is on this page :-

- https://www.softwareadvice.com/resources/using-google-analytics-for-marketing/

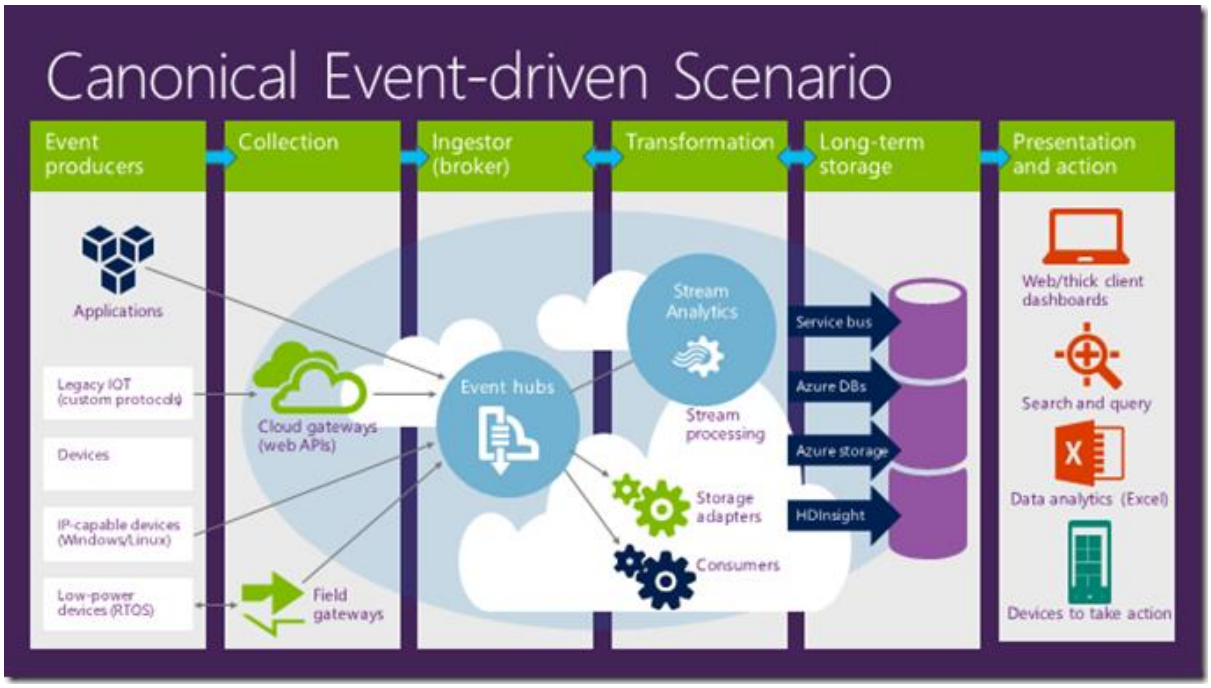
and looks like this :-

10.6 Microsoft (1)

After I had finished writing about Universal Data Platforms, I came across this item from Microsoft :-

- https://blogs.msdn.microsoft.com/kaevans/2015/02/26/using-stream-analytics-with-event-hubs/

and his Data Architecture looks like this :-

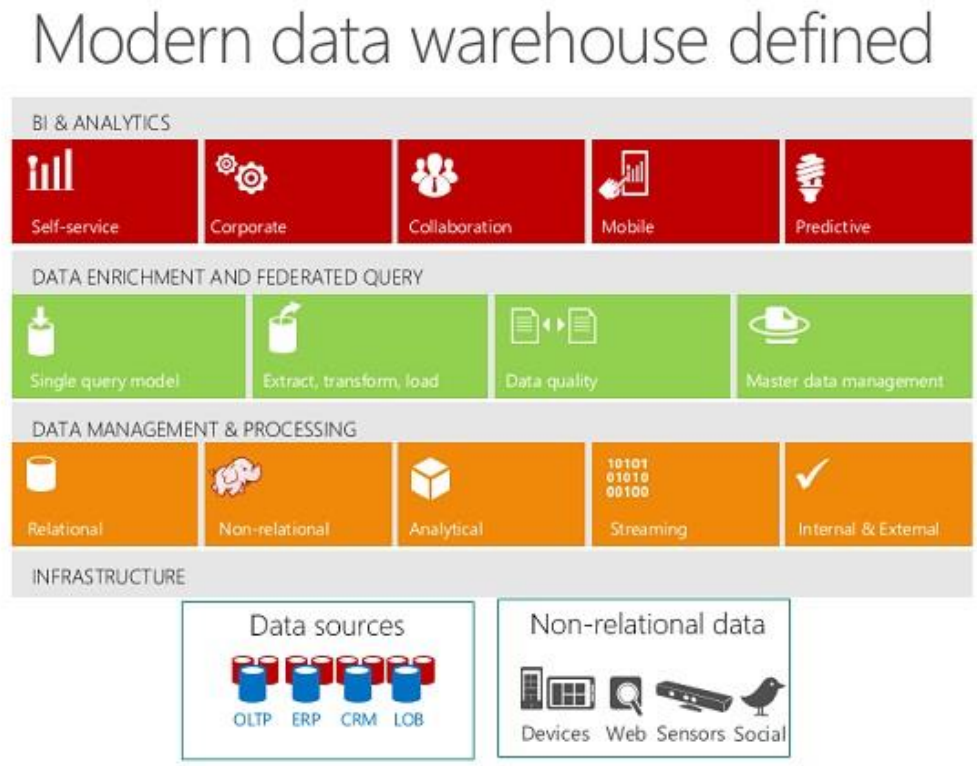


10.6 Microsoft (2)

James Serra of Microsoft has published a 'Modern data warehouse defined' on this page :-

- http://www.jamesserra.com/archive/2014/12/the-modern-data-warehouse/

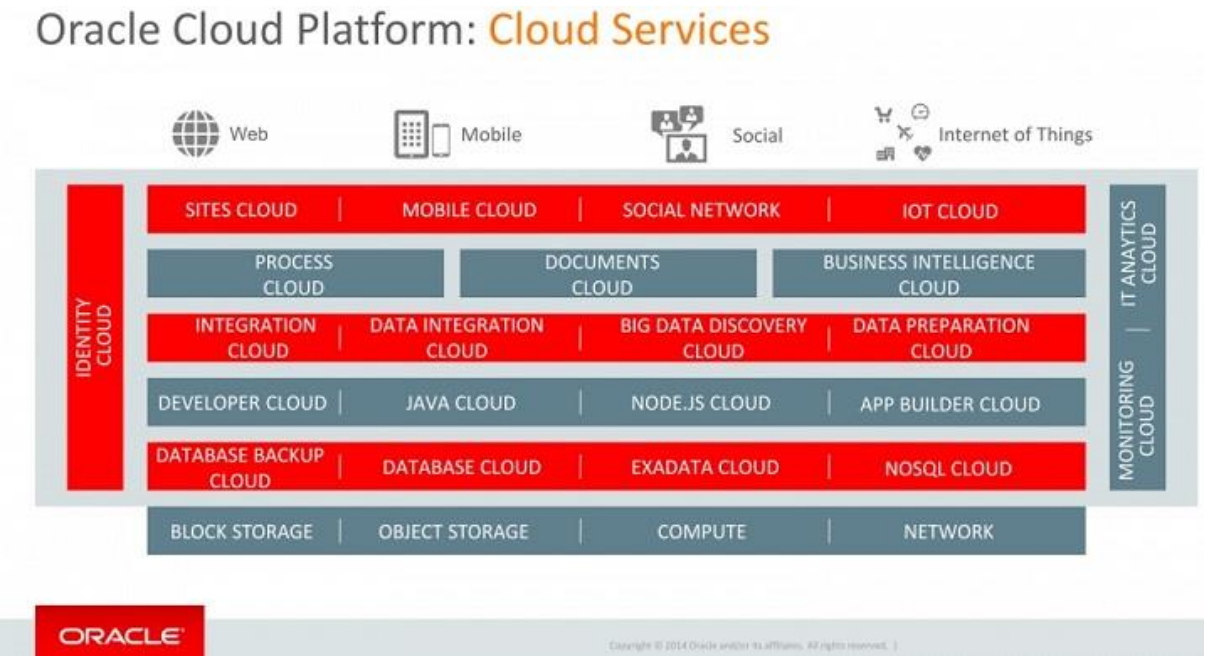
and his Data Architecture looks like this :-



10.7 Oracle

Oracle says 'Cloud Computing is simple :-

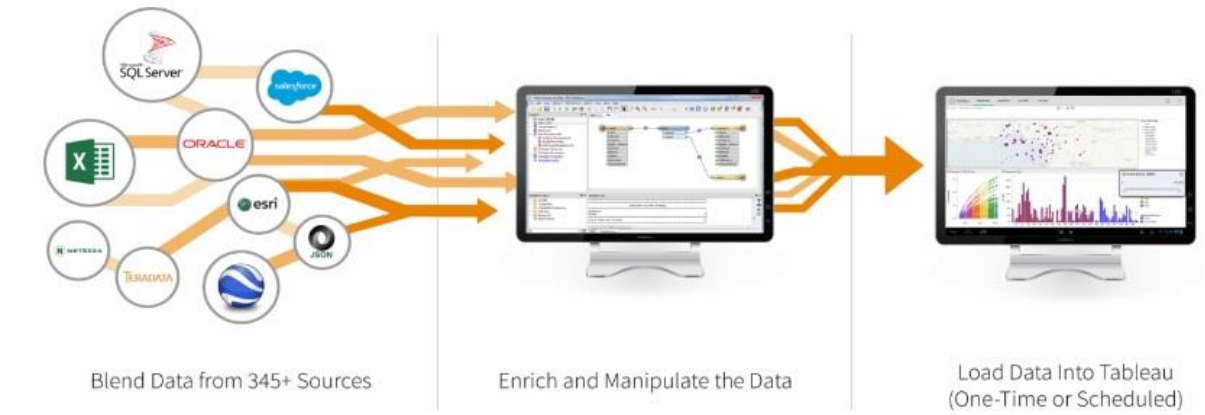
- https://www.altoros.com/blog/oracle-says-cloud-computing-is-simple/



10.8 Tableau

Here's an example I like from a Dutch company called Fontys on this page featuring Tableau :-

- https://fontys.nl/Studeren/Minoren/Minor-Data-Driven-Business/Content-of-the-Minor.htm

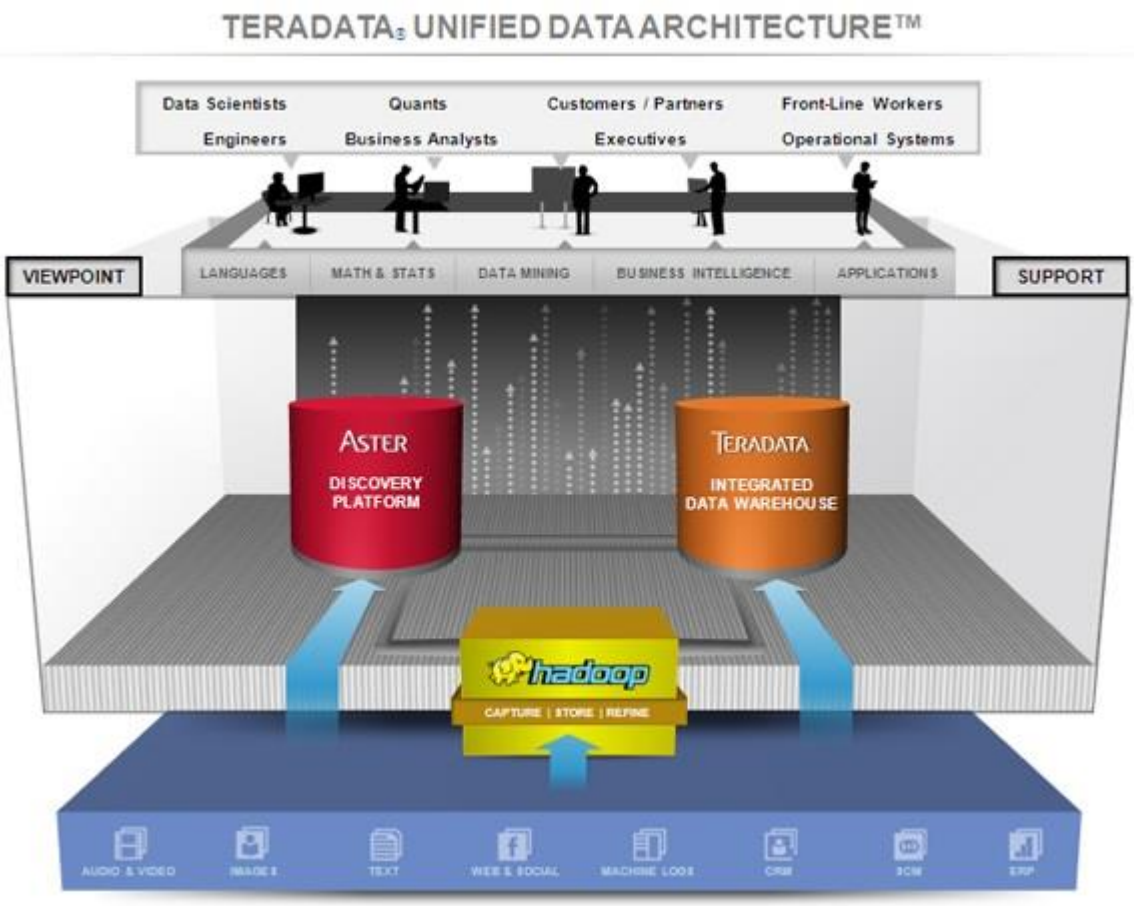


10.9 Teradata

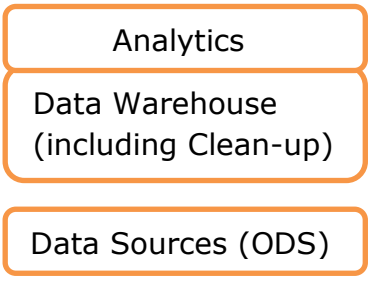
This is shown on our Web Site at this page :-

- http://www.databaseanswers.org/data_models/big_data/Teradata_Unified_Data_Architecture.htm

It looks like his :-



And looks like this, which is a good example of these basic Layers that I look for in every Data Platform :-



10.10 Conclusions

We hope you found this paper interesting.

Our intention is to review progress to the establishment of an industry standard 'Universal Data Platform'.

Our feeling is that progress is slow and for users, it is not an easy or straightforward path
Big Data, the Cloud and Mobile Devices are all key factors in the rate of progress for individuals and organisations towards the wide adoption of a 'Universal Data Platform'.

In the meantime, if you have any comments, questions or suggestions feel free to email me at barry@databaseanswers.org .

11. Some useful Links

Here are some useful links to Wikipedia :-

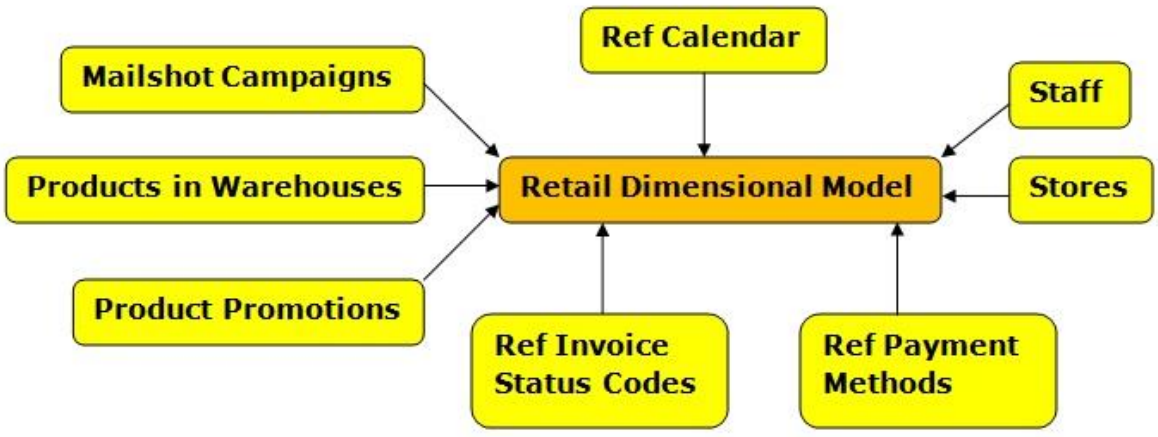
- Data Lake - https://en.wikipedia.org/wiki/Data_lake
- Data Mart - https://en.wikipedia.org/wiki/Data_mart
- Data Warehouse - https://en.wikipedia.org/wiki/Data_warehouse
- ETL - https://en.wikipedia.org/wiki/Extract,_transform,_load
- Operational Data Store - https://en.wikipedia.org/wiki/Operational_data_store
- Semantic Layer - https://en.wikipedia.org/wiki/Semantic_layer

12. Data Marts and Warehouses

12.1 Data Marts

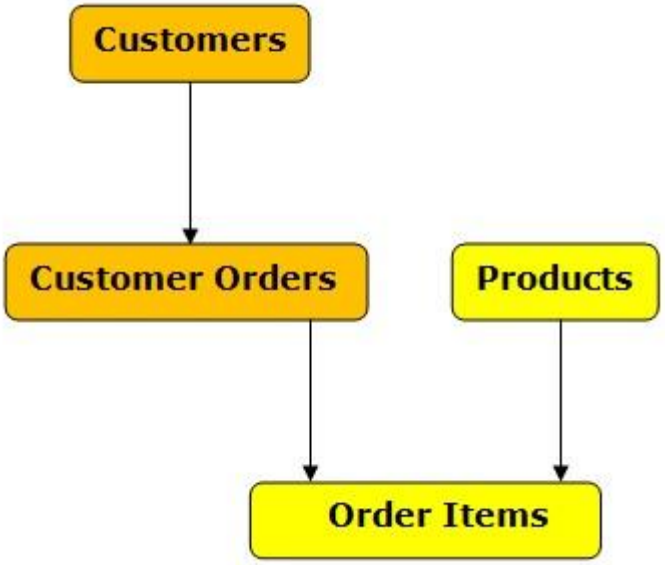
Data Marts are designed to support Enquiries with Dimensions, such as 'How many Products were sold to Men and Women last Month'.
Here we show a Conceptual Data Mart for Retail Sales from this page

- http://www.databaseanswers.org/data_models/retail_sales/index.htm



12.2 Data Warehouse

Here is a Retail Data Warehouse from the same page :-



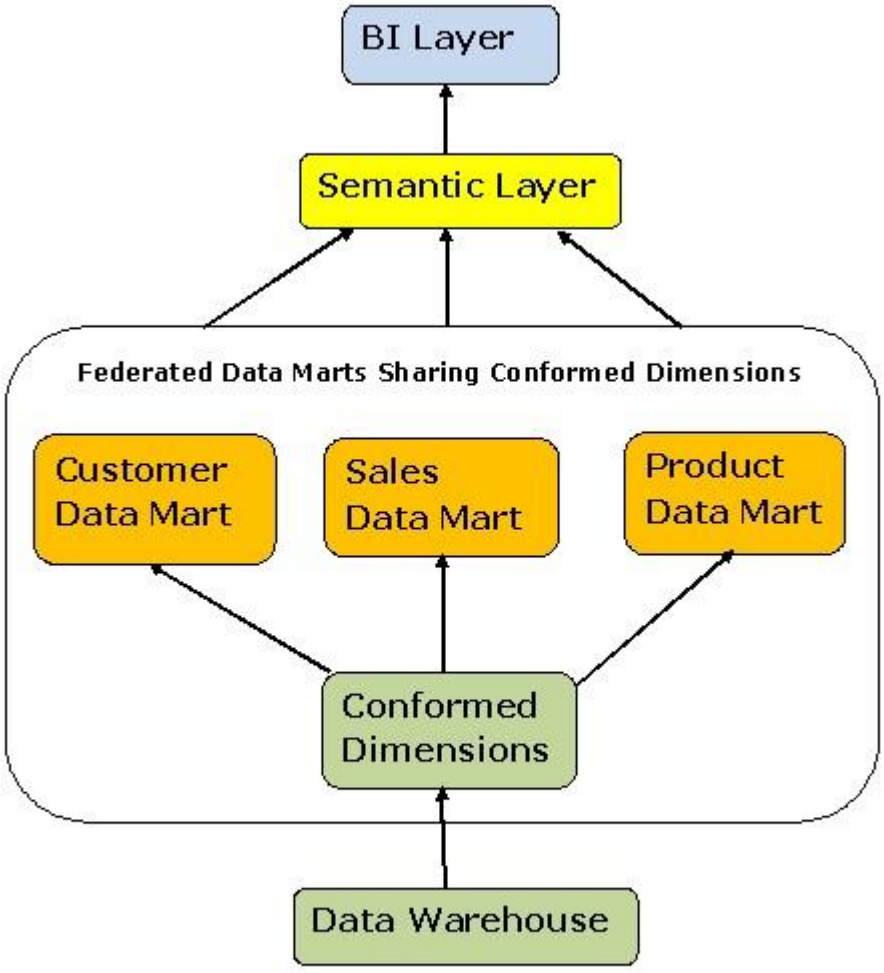
These are designed to reflect the structures involved in producing a ‘Single View of the Truth’.
The other kind are called Data Marts.
It occurred to me last night that these two different types might be used differently in your research.
In fact, you might want just one type.

12.3 Federated Data Marts

These share Dimensions and support complex Reports and Business to English translation.
This diagram is shown on this page :-

- http://www.databaseanswers.org/data_models/federated_data_marts/index.htm

and looks like this :-



13.Conclusion

Our intention with this document is to publish Best Practice in Enterprise Data Management combined with Templates that demonstrate how Best Practice is applied in practical.