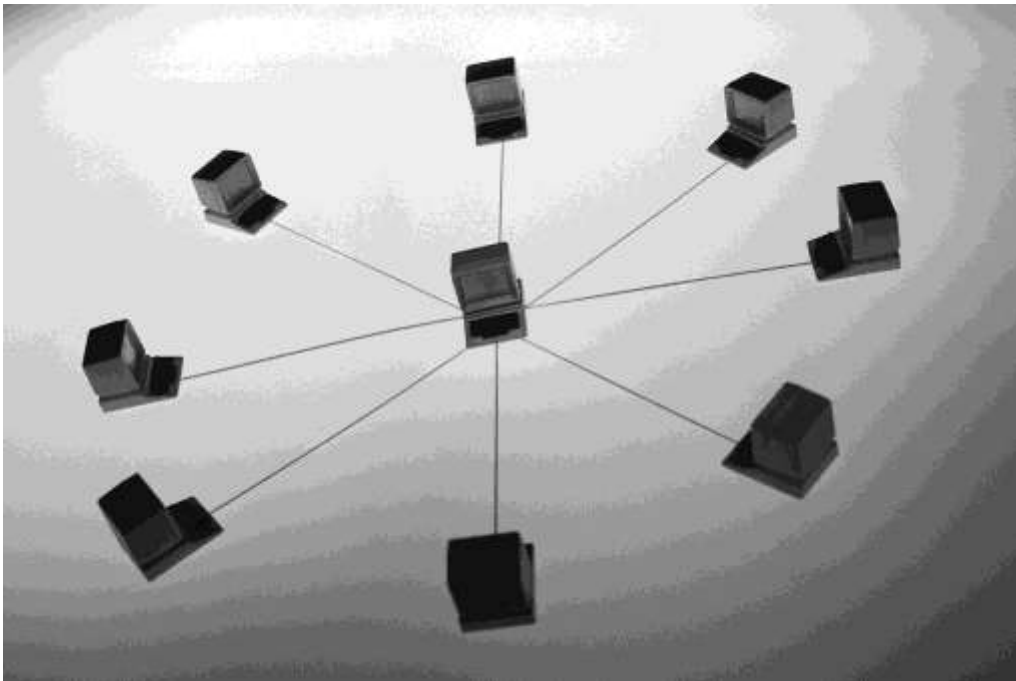


# **Business Intelligence: Product Design & Development**



## Contents

INTRODUCTION .....	3
1. THE LIFE CYCLE PHASES.....	3
1.1. PRODUCT VALUE DEFINITION:.....	3
1.2. PRODUCT SCOPE DEFINITION:.....	4
1.3. Product Scope Scorecard.....	5
OCS framework of the Business Intelligence Value Chain .....	6
Technology adoption process .....	6
1.4. DESIGN .....	7
1.5. MODEL WISE COMPARISON OF FEATURES: .....	15
1.6. PRODUCT DESIGN CASE STUDY FOR A BUSINESS INTELLIGENCE COMPANY XYZ: .....	16
1.7. CONSTRUCTION .....	18
1.8. CONFIGURATION MANAGEMENT:.....	18
1.9. TESTING & QA.....	19
1.10. RELEASE MANAGEMENT .....	20
2. OCS TEAM COMPOSITION & RESPONSIBILITY.....	21
3. ENGAGEMENT MODELS: .....	22
4. CONCLUSION.....	23
5. ABOUT OCS .....	23
6. CONTACT.....	23

## OCS's Product Development Lifecycle

### Introduction

OCS has developed product development framework based on its experience in conceptualizing, developing and managing IT products. This document explains our approach towards software product development in general and discusses the specifics of Business Intelligence (BI) product development in detail.

Key factors in successful engineering and development of BI software products are:

- ⇒ Develop software iteratively
- ⇒ Manage Requirement
- ⇒ Use component based architecture
- ⇒ Prototype user interface
- ⇒ Continuously verify product quality

### 1. The Life Cycle Phases

This document covers following phases of product development lifecycle. The document however excludes the phases of product development like Market Requirement Analysis, Conceptualization etc.

- ⇒ Product Value Definition
- ⇒ Product scope Definition
- ⇒ Design
- ⇒ Construction
- ⇒ Testing and QA
- ⇒ Release Management

#### 1.1. Product value definition:

This process gives us the strategic intent for the product, its value proposition, and the market it plans to cater. This step is very critical to the product development process because we examine the value proposition from the user's perspective. This process covers:

- Need assessment.
- The business environment.
- The Technology environment.
- Competitive product environment in the related product space.

## 1.2. Product scope definition:

In this process we detail the product value scope based on need parameters. We adopt a well defined scorecard methodology for this purpose.

The product intent could be as an add-on to an existing product or could address the complete Business Intelligence solution. The product proposition could also address only a specific value element in the Business Intelligence space like dash boarding or high end analytic engine etc.

In real time scenario we will build this list after discussions with customer's team. We interact extensively with the top management & the product team to understand the overall vision of the company and the strategic intent for introducing the product. Based on the vision, we blend our strategy to facilitate the entire product design to delivery lifecycle. The scorecard parameters would be designed using the insights provided by the client and our development team.

In the Business environment, we would deliberate on the business model for which the product would be designed. We would take a good look at the business model that the product would add value to. The features that would most excite and add values to the users are zeroed on in this phase.

In the technology environment we would examine the technology backbone that the product would fit in. Each technology piece would be detailed to find out its use and the scope for value addition.

In the competitive environment, we would examine similar product solutions to understand the value proposition and the technology enablers.

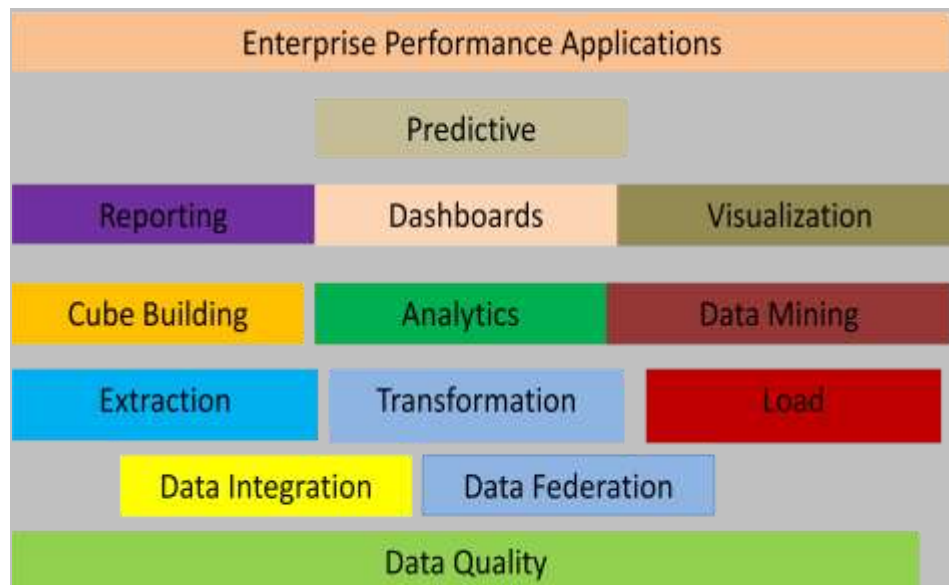
A sample snapshot of the Product scope scorecard containing a few parameters in Technology, Business, People, utility, business model etc. are shown in the table below.

### 1.3. Product Scope Scorecard

S no.	Parameters	High	Medium	Low
1.	Collaborative Environment – Internal / External			
2.	Compliance/Governance			
3.	Complex Business Rules			
4.	Open Environment – Reporting, data source capture			
5.	Secured Environment			
6.	Audience involved			
7.	Data Sources			
8.	Real time Environment			
9.	Data Federation			
10.	Geographic spread			
11.	Web enablement			
12.	Protocols			
13.	Mobile Connectivity			
14.	MS Office Environment			
15.	Client base			
16.	Integration of Clients in the BI environment			

#### Integrating the Business Intelligence Value chain Model with the product scope

A scorecard approach is used to rate the overall product scope within the Business Intelligence Value chain:



## OCS framework of the Business Intelligence Value Chain

S No.	Parameters	High	Medium	Low
1.	Data Quality			
2.	Extraction			
3.	Transformation			
4.	Load			
5.	Data Integration			
6.	Data Federation			
7.	Cube Building			
8.	Enterprise Reporting			
9.	Dashboards			
10.	Enterprise Applications			
11.	Predictive Capabilities			
12.	Data Mining			
13.	Visualization			
14.	Alerting & Notification			
15.	Working Offline			

## Technology adoption process

From the Integrated business Value chain model, we would select the technology best suited for meeting the standards on the following lines

- 1) API interface standards
- 2) Cost of adoption
- 3) Meeting the scope standards
- 4) Flexibility
- 5) Graphical user interface
- 6) Scalability
- 7) Scope for value addition
- 8) Penetration of the technology – Usability, Training etc
- 9) Features – Data management capabilities, Data Volume, Data sources
- 10) Performance on critical parameters.
- 11) Engines – Rules, OLAP
- 12) Metadata

In this process we identify the most appropriate technology enabler that fits the desired model architecture. We would consider customized technology development and integration if the scope is not fulfilled by available tools and technologies.

## 1.4. Design

The prototype acts as a proof of concept for reducing the risk of using new technology and working on a new domain. The real challenge comes when designing a futuristic architecture for the product under consideration. The main criteria when architecting a solution are:

- ⇒ Scalability
- ⇒ Security
- ⇒ High Availability
- ⇒ Maintainability

In this process we design the complete value proposition of the product. It includes the entire technology composition with the value delivered from the product.

It would be interesting to note that most of the products designed largely fall in the models that we are illustrated below.

It would be interesting to note that most of the products designed largely fall in the models that we have illustrated below. (The Business Intelligence product comfortably fits the business model).

Developing a product that will enhance the Business Intelligence Value chain will require a detailed analysis in terms of business value it would like to deliver. We have exemplified a few products that typically cater to enhance the business value.

### **SaaS model for BI Product:**

Many organizations realize that Business Intelligence can bring business benefit to the organization but the BI products are not affordable to all. One of the main reasons why BI is not successful in many organizations is the complexity and the Cost of deployment. Moreover constant changes and new releases make the adoption of the technology a bottleneck.

The current trend in BI vendors is to develop the product such that many Customers can share the application using Software as service concept. Our product development framework will take into account the following concepts:

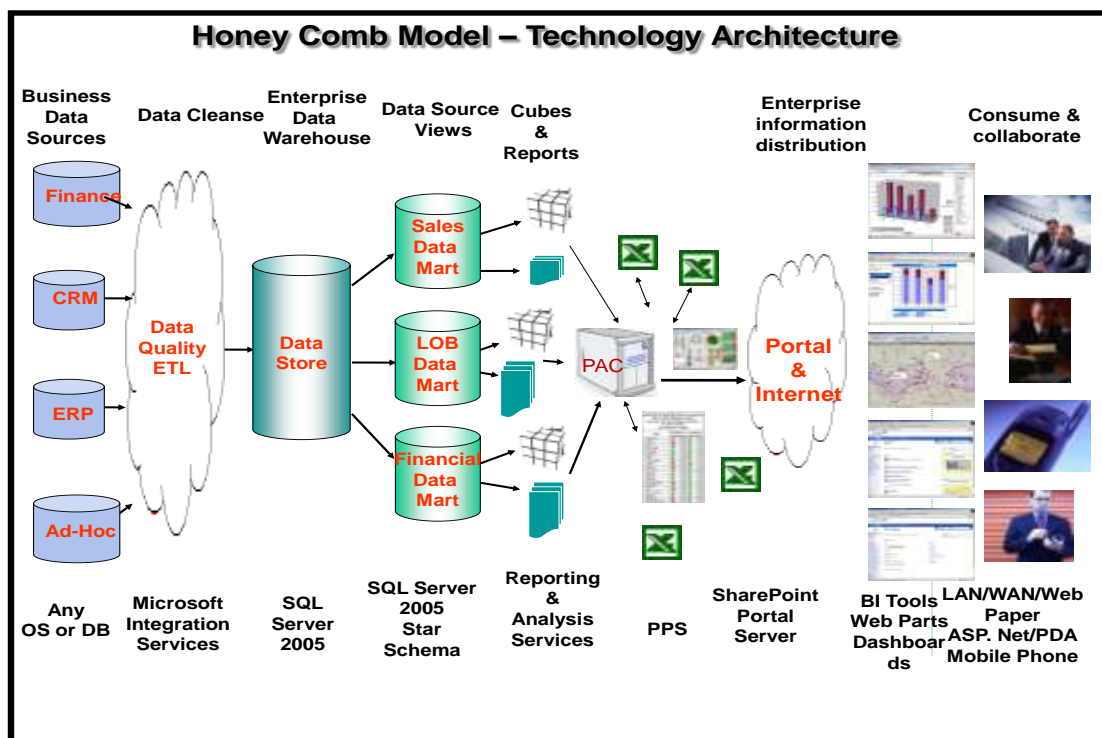
- ⇒ Web Based Access for anytime anywhere access
- ⇒ Component Based Architecture for extendibility and shorter time to market
- ⇒ Service Oriented Architecture for expandability
- ⇒ Design patterns for scalability
- ⇒ SSL for security

### 1.4.1. Honey Comb Model

Typically multi-product companies in different businesses present globally would require a collaborative environment. Their business drivers would be to derive maximum value from the distributed operational business intelligence. The business scenarios and models would frequently change depending upon the products and their businesses. They would prefer an end to end business intelligence solution that would also address key Enterprise applications like Planning, Budgeting, Monitoring, Forecasting and Consolidation.

The Product developed around this model should have the following technology enabling features such as:

- Collaborative Environment; Performance Point Server with excel-add in features
- Distributed Operational Intelligence with the Share Point Server portal environment where access can be given to all users.
- A mobile / PDA application designed to deliver point in time information.



E.g. Business Conglomerates.

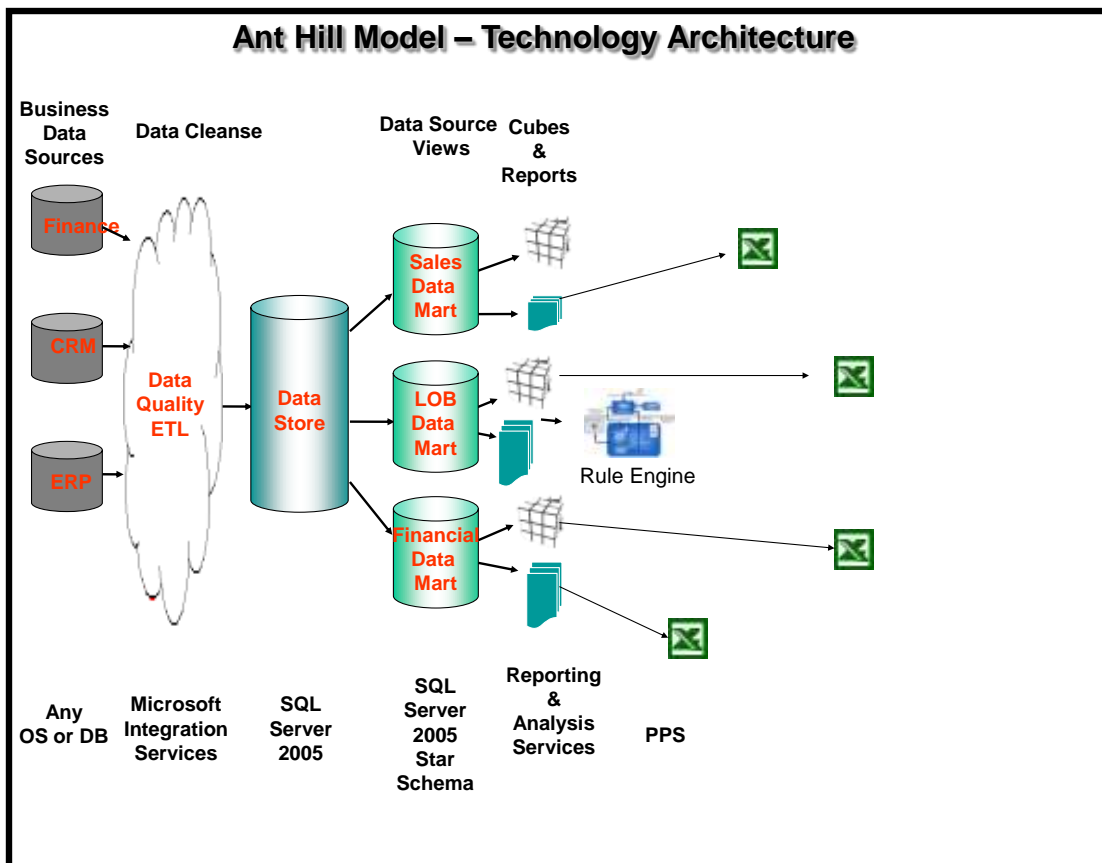
### 1.4.2. Ant hill model

Typically single product companies operating in a said geography would require simpler model that serves the immediate business requirement, providing scope for scalability, scope for SOA, and scope for enhancing Business rules. This model gives the basic delivery of reports analyzed from the database.

The Product developed around this model should have the following technology enabling features such as:

- Analyze the company database and deliver simple reports.
- A rule engine to check on the scenarios that can be quickly built to take effective decisions.

E.g. SMB businesses



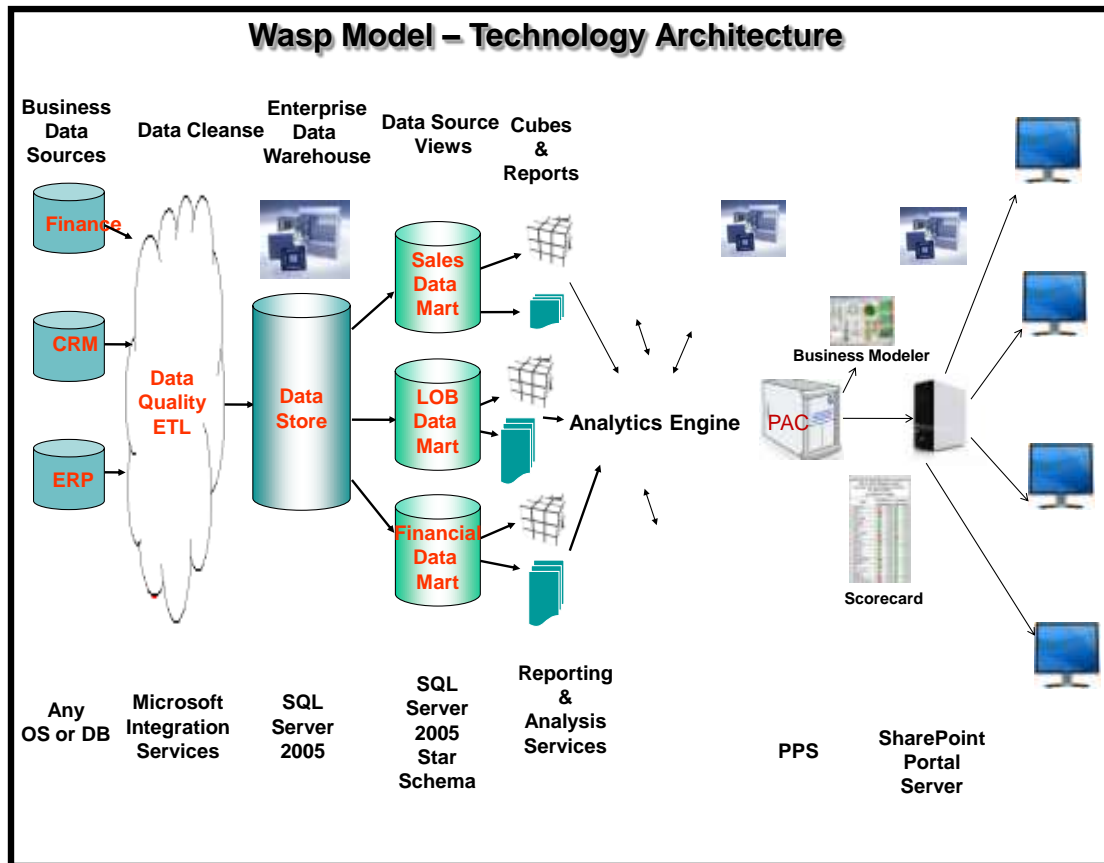
### 1.4.3. Wasp Model

Companies in various research and development of highly sensitive areas would require a high level of security. They have well defined data source. Their Data warehouse design is regimented and compartmentalized for only a pre-defined activity. They would require sophisticated analytics for analyzing the research inputs.

The Product developed around this model should have the following technology enabling features such as:

- They would need robust analytical engines so that the research source data can be analyzed.
- They would need to develop models on Performance Point Business Modeler to develop scorecards to evaluate between scenarios.

E.g. Research, Bio-tech companies



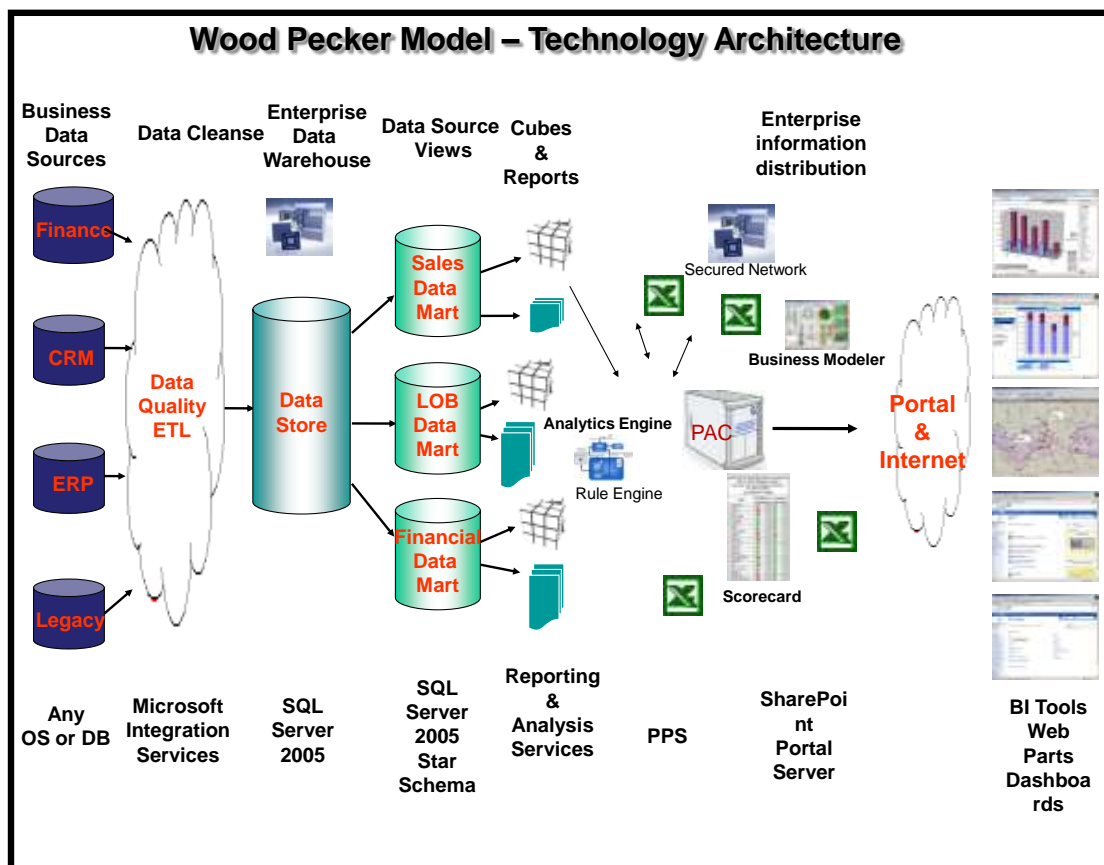
### 1.4.4. Woodpecker Model:

Companies with huge customer base and high level of transactions would require a robust ETL design. Typically a legacy system exists within the company. This model would be very robust and highly optimized & scalable.

The Product developed around this model should have the following technology enabling features such as:

- The ETL design strategy should have robust Transformation and Load Strategies designed.
- The data Integration must be highly optimized to the data warehouse design.
- An analytics engine and business rules Engine
- A secured network
- An enterprise reporting architecture

E.g. Consumer banking



### 1.4.5. Weaver Model:

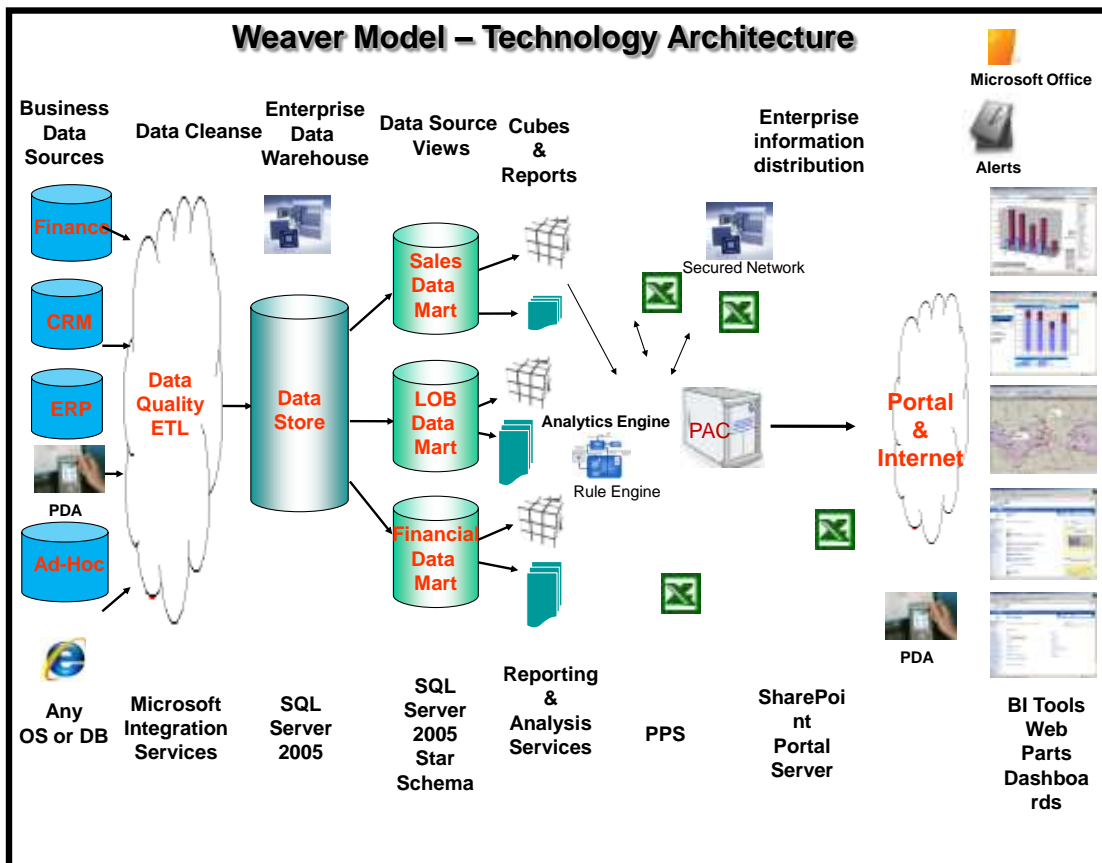
Companies with mobile and field work force would go for Weaver model.

The information sources are well defined but disparate and disconnected. Each data source is critical as it includes website data and the information that has to be consumed by a mobile work force. The business processes are complex with simple analytics.

The Product developed around this model should have the following technology enabling features such as:

- An ETL design which can connect to various sources needs to be well defined. The Extraction process has to be well designed.
- A synchronization services will be used to a great extent to map the data.
- A secured network at the server & reporting level will be required.
- Enterprise information architecture would consist of dashboards and integration with the office environment.
- Mobile / PDA report delivery would be robust.

E.g. Supply Chain companies



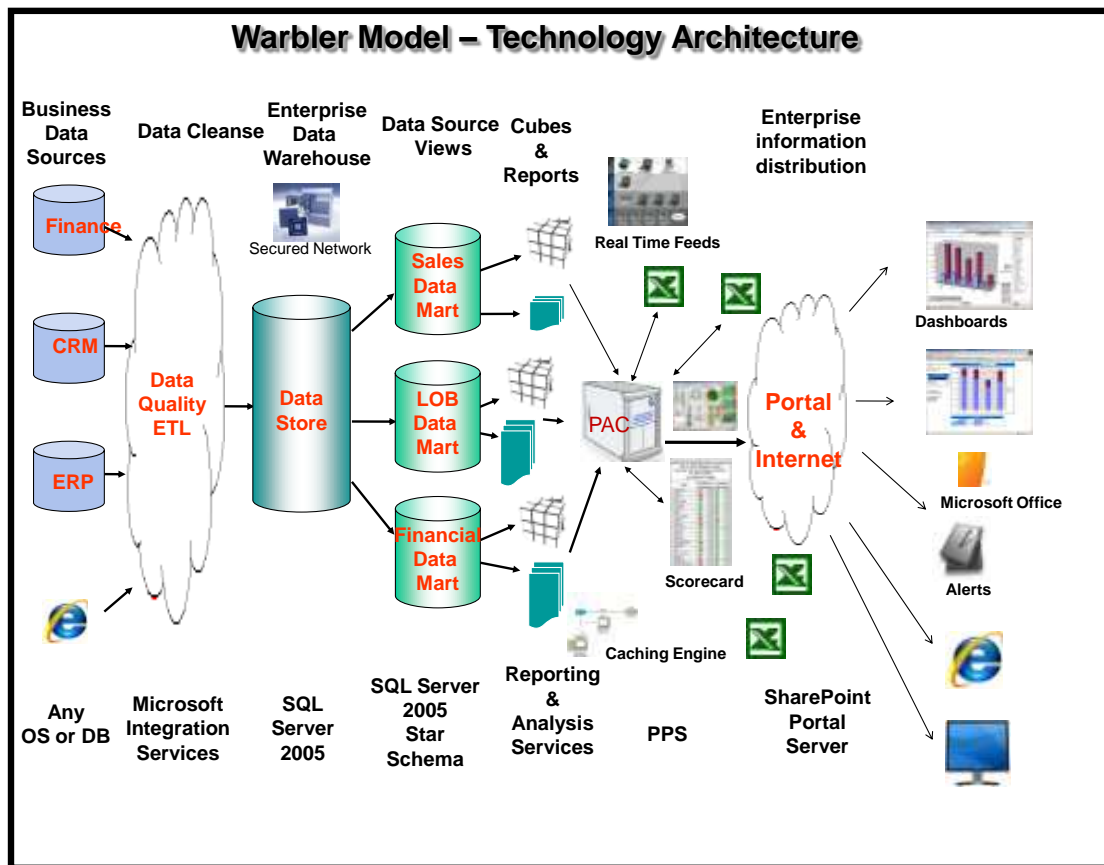
### 1.4.6. Warbler Model:

For companies with information that is used on real time basis, we recommend Warbler model. Companies that rely on real time feeds and that need to create and deliver point in time report, data latency is of utmost importance to such companies. Report delays may mean information lost. They usually have low logs of data maintenance based on recommendations but maintain transaction logs only. It would require a high level of security.

The Product developed around this model should have the following technology enabling features such as:

- A robust caching engine would be required so that the information can be analyzed to enable quick decisions.
- Integration of well defined Office environment.
- Real time feeds will be captured and applied as data points to well defined algorithms that address business logic for enabling quick decisions.

E.g. Stock broking house



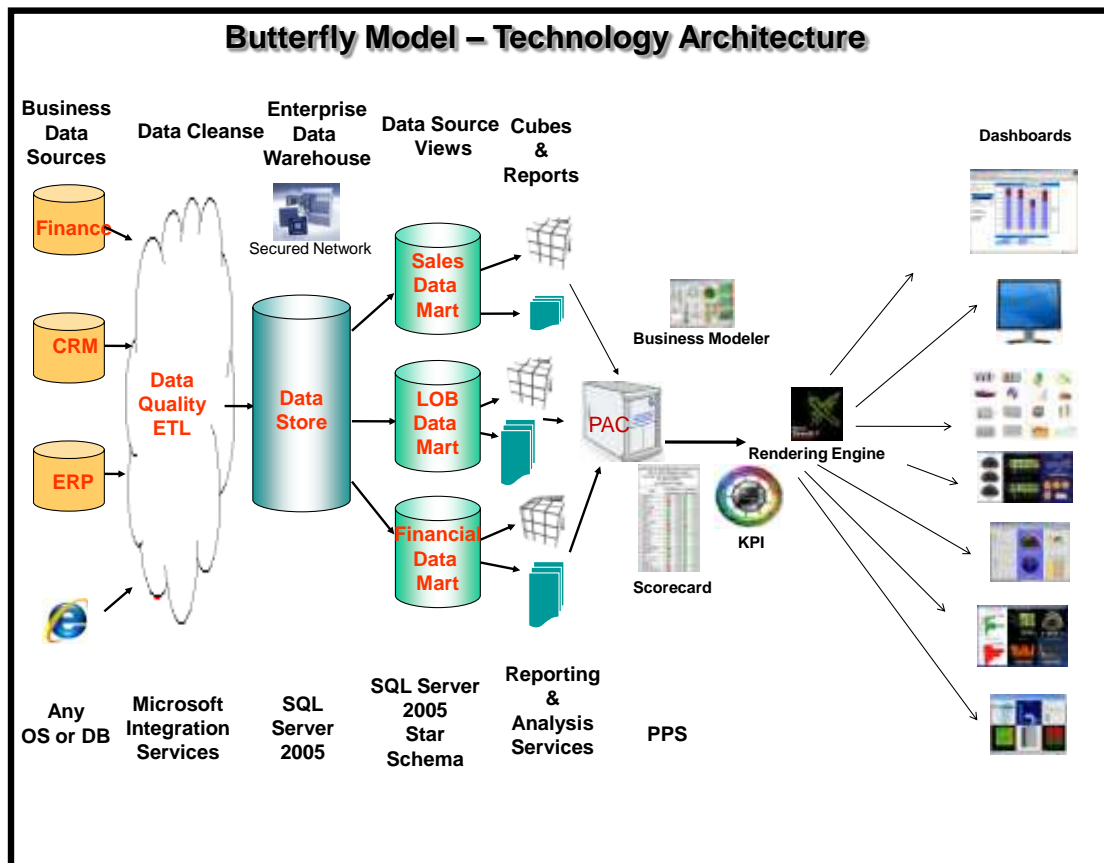
### 1.4.7. Butterfly Model:

This model fits for companies and users who require bird's eye view of the business only. With the introduction of Business Intelligence solutions, there have been a plethora of dashboards, scorecards; KPI's which is being demonstrated to Business users. This usually gets very confusing to top level decision makers with very short time at hand. This also means that for contextual or Scenario based KPI's, complexity may compound further. The screen space for all the necessary business performance indicators may be much cluttered thereby confusing the decision maker. The decision maker here needs high end visualization, with a mandate of seeing a single page report that gives the bird's eye view of the business.

The Product developed around this model should have the following technology enabling features such as:

- Well defined KPI's
- A rendering engine which gives pixel compression based view on a single page.
- High end visualization for only representation of data. There would be no analytics enabled in this product.

E.g. Government President Office, CEO office.



## 1.5. Model wise comparison of features:

We have tried to highlight the strategic business models that get addressed in the Business Intelligence value Chain. A comparative matrix highlighted below is used as a framework for arriving at right business model. The need of parameters/features by each of the model is addressed by high, medium & low.

No.	Parameters/Features	Honey Comb	Ant Hill	Wasp	Wood Pecker	Weaver	Warbler	Butterfly
1.	Collaborative	H	L	M	H	H	H	L
2.	ETL	H	L	M	H	H	H	L
3.	Data Federation	M	L	H	H	L	H	L
4.	Scalability	H	L	M	H	H	H	L
5.	Metadata Management	H	L	M	H	M	H	L
6.	Open Systems	L	L	L	M	L	H	L
7.	Extranet enabled	H	L	L	H	H	H	L
8.	Alerts & Notification	H	L	L	H	H	H	L
9.	Service Oriented Architecture	H	L	L	H	H	H	L
10.	High levels of Security	M	L	H	H	H	H	L
11.	Highly Optimized	H	L	H	H	M	H	L
12.	Real Time	L	L	M	M	H	H	L
13.	Offline analysis	M	L	M	H	H	H	H
14.	Mobile & PDA Enabled	M	L	L	L	H	L	L
15.	Business Rules	M	H	M	H	M	L	H
16.	High end Analytics	M	L	H	H	M	L	L
17.	Forecasting	M	L	H	H	M	L	M
18.	High end Visualization	M	L	M	M	L	L	H
19.	Enterprise Applications	H	L	L	M	M	L	L
20.	Pervasive Intelligence	H	L	L	H	H	H	L

All models will be developed using the standard features that are required in the business Intelligence value chain. However, customization wherever required will be done using .NET , Visual basic and other available technologies to supplement the entire value chain.

## 1.6. Product Design Case Study for a Business Intelligence Company XYZ:

Customer in discussion wanted to develop a BI solution. Microsoft technologies were not first and obvious choice of the customer for this project.

With a detailed study as highlighted above, along with the client we arrived at the following product roadmap. This case was very interesting as it did not typically fall in any of the models that we described. However there was a leaf of learning from each model that we could use.

Product Value Statement: “Enable decision making for business users on the fly”.

### Product Strategy Intent

- a) Targeted to Small & Medium sized business houses
- b) Multiple disparate data sources which offer connectivity (odbc/oledb/jdbc etc...)
- c) Simplified ETL process which enables quick connection to the source data (including excel)
- d) Simple business analytics, business rules and Visualization as dashboards
- e) Empower the business user with easy to make reports on the fly. This would mean enable offline work on the desktop.

### Assumptions in the Product design:

- a) Data Quality is intact. This may be a very difficult assumption to make as data quality is a real issue in the Business Intelligence scenario.
- b) Data Loads are not very high.

### The Technology differentiator:

The company had developed a patented technology that could connect to multiple data sources and treat the data as unique data points that needs to be analyzed or reported.

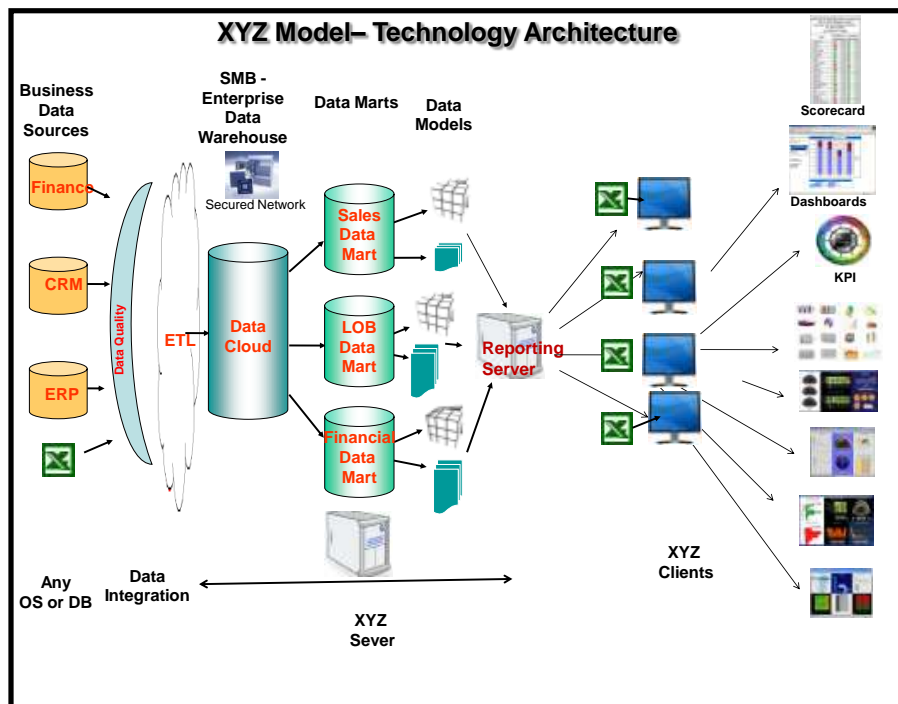
### Some known challenges:

- a) Scalability as data loads increases.
- b) Collaboration that the customers may seek.
- c) High end analytics, Business Rules that the customers may need.
- d) Data Explosion if the data quality is improper i.e. if the same Customer name has been entered differently will be treated as unique and hence the explosion.
- e) The data captured was in a unique format which could be read only by the product.

Overcoming of Challenges: Some salient features

- a) **We suggested that X 64 bit processor at the client end.** This may be a little difficult to accept initially but with memory becoming cheaper it could be well accepted.
- b) Highly Normalized data was recommended.
- c) We recommended a server based architecture for the product.
  - I. Ensuring central capture of data information so that the ETL could be well defined.
  - II. Reporting requirements were well defined.
  - III. Data slices offered to the user based on his analysis and reports.
  - IV. Refresh data loads incrementally to serve the respective business users based on user hierarchy and report requirements. The client needs to talk to the server once for data refresh.
- d) User based CALs for the desktop version.
- e) Recommended that this solution would quickly give insights into the data quality issues as it immediately appears as different. However rectifying the same within the product was possible but cumbersome.
- f) Recommended query based optimization so that in the server based environment report consumption is executed faster
- g) Suggested a reporting server to look at future collaboration requirements.
- h) We suggested that components to read the data structure wherever necessary be developed within the product.

The typical Technology architecture for XYZ Company is depicted

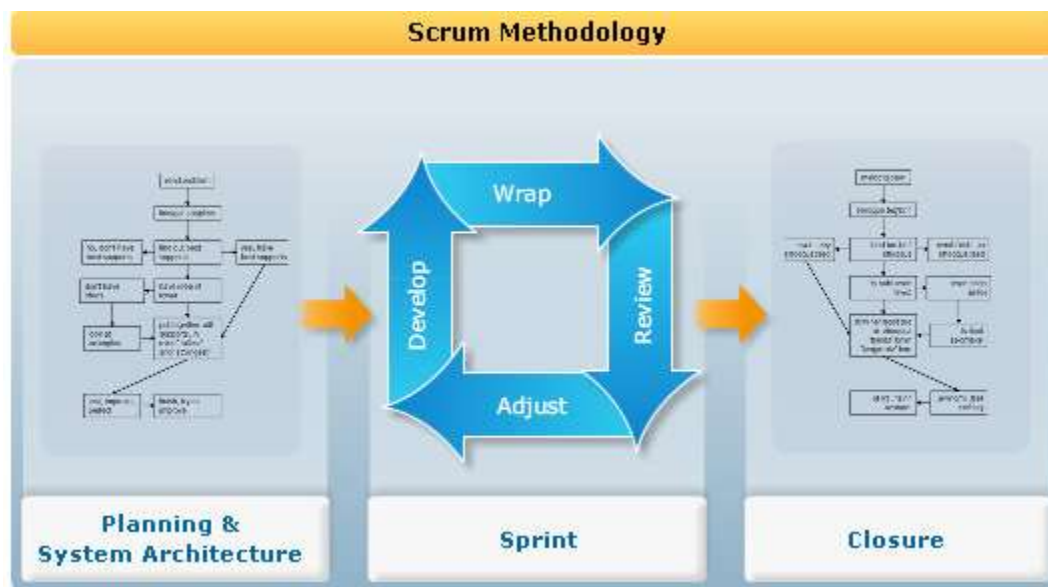


## 1.7. Construction

We use SCRUM methodology for product development activities: This methodology is proven to be more suitable for product development in an offshore – on-site model. The builds can be planned as per the milestones defined by the Clients marketing team based on the time to market the product. The philosophy of SCRUM methodology is:

- **Always have a product** that you can theoretically ship: “done” can be declared at any time.
- **Build early, build often.**
- **Continuously test** the product as you build it.
- **Assume requirements may change**; Have ability to adapt to marketplace changes during development.
- **Small teams** work in parallel to maximize communication and minimize overhead.

The following diagram depicts the SCRUM methodology based on Agile standards



## 1.8. Configuration Management:

Software configuration management is the critical part of any software product development methodology. Managing the different versions of the code and other artifacts of the product becomes critical in a product development environment. Different versions of the code are maintained at different customer sites as the number of releases go on increasing. It also helps us to traceability management. We at OCS use Microsoft’s Version Safe Software (VSS) to configuration management.

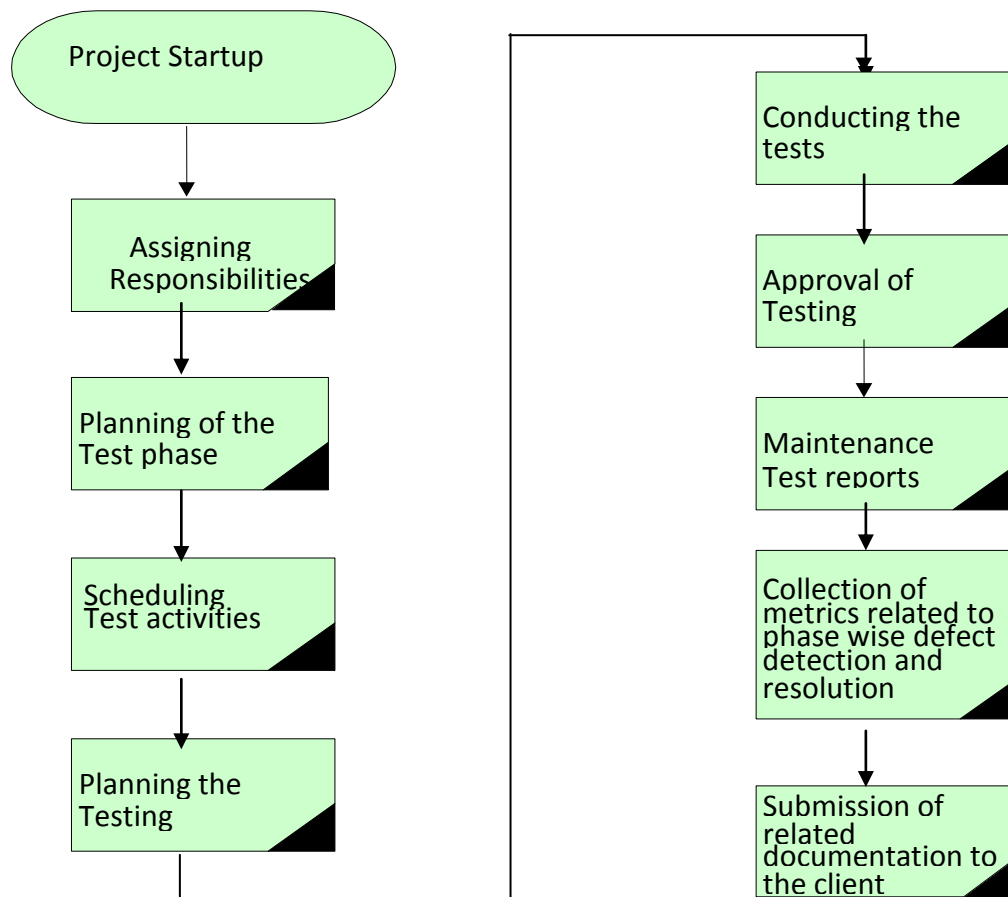
## 1.9. Testing & QA

Testing is a complex process, which requires greater knowledge of the product and the underlying domain. We have a team of QA analyst who understands complexities of a product testing methodology. Our product testing covers following aspects:

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li>• Functional Testing</li> <li>• Performance Testing</li> <li>• Load/Stress Testing</li> <li>• Regression Testing</li> <li>• White box testing</li> <li>• Black box testing</li> </ul> | <ul style="list-style-type: none"> <li>• Acceptance Testing</li> <li>• Manual Testing</li> <li>• Automated Testing</li> <li>• Test Script Design</li> <li>• Test Planning</li> <li>• Test Reporting</li> </ul> |
|--|--|

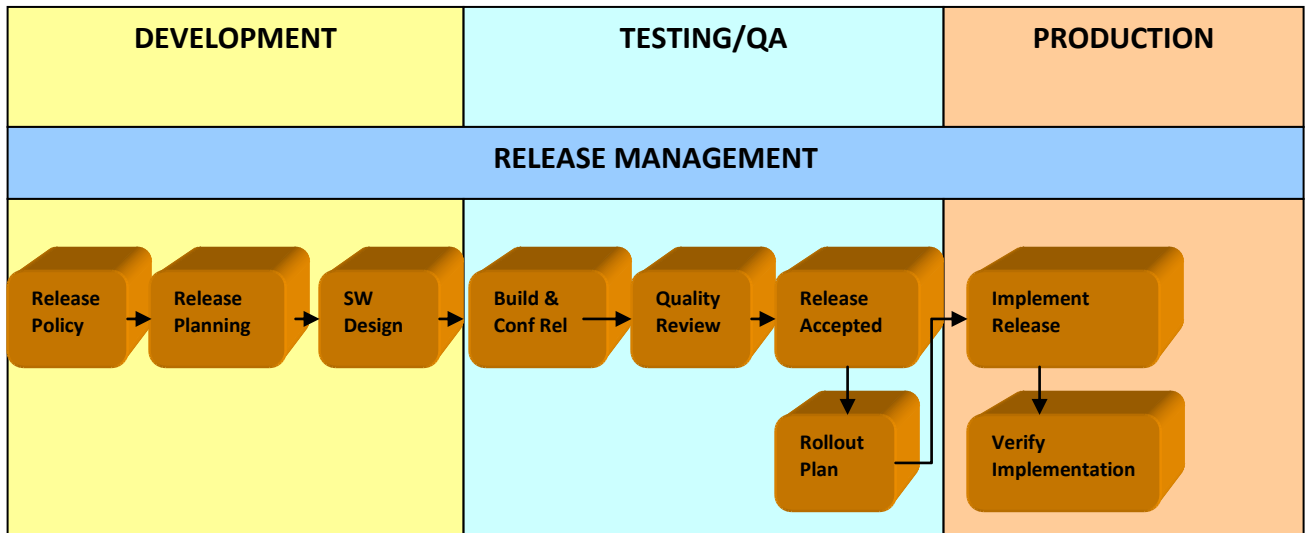
We use an in-house developed defect tracking tool to log the defects. The software tool has a complete workflow for logging the defect till the closure of defects. It gives analytical reports such as “Defect leakage Report”, “Defects by Stages Found”, “Defect Ageing report.”. The following diagram depicts the testing process followed at OCS.

### Testing process



## 1.10. Release Management

We will customize the release management activity as per the customer's existing process. Our typical release management process is as shown below:



## 2. OCS Team Composition & Responsibility

Project Role	Available	Responsibility
<b>Project Manager</b>	Y	<ul style="list-style-type: none"> <li>- <b>Planning &amp; Scheduling</b></li> <li>- <b>Client Communication</b></li> <li>- <b>Project tracking &amp; Monitoring</b></li> </ul>
<b>Domain Experts</b>	Y	<ul style="list-style-type: none"> <li>- <b>Provide domain knowledge</b></li> <li>- <b>Data Dictionary of domain terms</b></li> </ul>
<b>ETL Architect</b>	Y	<ul style="list-style-type: none"> <li>- <b>Design of the logical and physical DW schema</b></li> <li>- <b>Analyzing source systems and creating a mapping to the target DB schema</b></li> <li>-</li> </ul>
<b>ETL Developer</b>	Y	<ul style="list-style-type: none"> <li>- <b>Defining and implementing the required business transformation rules and logic</b></li> <li>- <b>Identifying and managing data quality issues</b></li> <li>- <b>Designing and developing exception handling and data cleansing / standardization procedures</b></li> </ul>
<b>DW Architect</b>	Y	<ul style="list-style-type: none"> <li>- <b>Develop the data model</b></li> <li>- <b>Data warehouse Design</b></li> <li>- <b>DW Performance Analysis</b></li> </ul>
<b>DW DBA</b>	Y	<ul style="list-style-type: none"> <li>- <b>Create the DW/DM</b></li> <li>- <b>Performance Tuning</b></li> </ul>
<b>End-user application developers</b>	Y	<ul style="list-style-type: none"> <li>- <b>.Net Developers</b></li> <li>- <b>SharePoint developers</b></li> <li>- <b>SQL Server Specialists</b></li> <li>- <b>MDX Experts</b></li> </ul>
<b>Source Code Management Administrator</b>	Y	<ul style="list-style-type: none"> <li>- <b>Source code Administration</b></li> <li>- <b>Release Management</b></li> </ul>
<b>Quality Manager</b>	Y	<ul style="list-style-type: none"> <li>- <b>Quality Planning</b></li> <li>- <b>Compliance Audits</b></li> <li>- <b>Quality Assurance</b></li> <li>- <b>Quality Control</b></li> </ul>

### 3. Engagement Models:

OCS Infotech believes in creating a Win-Win engagement model. We develop and nurture relationships that are mutually beneficial and that help meet business objectives of our customers. In the past, OCS has helped many customers ranging from fortune 500 global customers to small & medium business and has used different engagement models to suite to the needs and size of customer.

We usually propose following business models nonetheless we do not limit ourselves to any of these. We asses every customer relationship independently and conclude a right engagement model.

Model	Description
<b>Offshore Dedicated Centre</b>	<ul style="list-style-type: none"> <li>– OCS team works directly with customer’s core teams and act as an extended arm</li> <li>– Team adheres to client’s processes, methodologies and critical business objectives</li> <li>– Cost savings, resource flexibility and gains over long term are the main motivations</li> </ul>
<b>Fixed bid</b>	<ul style="list-style-type: none"> <li>– OCS work on this model for clearly defined requirements and objectives</li> <li>– Client can budget/predict certain amount for the project</li> </ul>
<b>Time and Material</b>	<ul style="list-style-type: none"> <li>– Suites most projects as requirements are loosely defined</li> <li>– This model can absorb changes, market trends and technologies</li> </ul>
<b>Combi-Model</b>	<ul style="list-style-type: none"> <li>– No two projects are alike and so are customers; type of project may call for specific business set up</li> <li>– OCS works with clients to derive at a mutually agreeable win-win model</li> </ul>

## 4. Conclusion

OCS Infotech is specialized in Business Intelligence space and Microsoft Business Intelligence product suite. At OCS, we have devised Product Development framework that caters to development activities in Business Intelligence domain.

The solutions and product design team at OCS Infotech understands the paradigms of product development and the differences between general product development and Business Intelligence product development. We have worked on various development models and we also follow SCRUM development methodology for better time to product.

OCS has required experience and expertise in executing Business Intelligence product development assignments through the complete development and maintenance lifecycles for product using advanced Microsoft BI technologies including the latest in-line Performance Point server.

In this paper we discussed our approach towards BI product development and the details of models, and technologies used in the same.

## 5. About OCS

OCS Infotech is a global Information Technology company specializing in Business Intelligence solutions. Through our competency centers in various technology and functional areas, we leverage technology to solve business problems of our customers.

OCS Infotech provides cutting-edge Information Technology solutions with a vision to grow the IP led businesses. Our vision is backed by 25 years of providing domain, technology and end-to-end solutions.

OCS InfoTech's core competency lies in setting up dedicated offshore software development teams for outsourced product development, testing, maintenance and release management. OCS InfoTech's services include software development, enterprise application integration and migration, which we term as the SEAM Suite. This helps our team of professionals to provide customized solutions high up in the value chain. These solutions include research, usability and prototyping.

## 6. Contact

For enquiries and more information, please contact us at:

**OCS Infotech India Pvt. Ltd.**

22 Gauri Shankar, Shivaji Housing Society, S.B. Road, Pune, India 411016

Phone- USA: 1 408 540 6426 / IND: 91 20 2563 7086/7097

e-Mail- [sales@ocsinfotech.in](mailto:sales@ocsinfotech.in)

URL- [www.ocsinfotech.in](http://www.ocsinfotech.in)