Predictive and optimal decision making for Intel's global business units with ETL processed data using MSBI

Submitted By

Aarohi Pujara

14MCEI19

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

INSTITUTE OF TECHNOLOGY

NIRMA UNIVERSITY

AHMEDABAD-382481

MAY 2016

Predictive and optimal decision making for Intel's global business units with ETL processed data using MSBI

Major Project

Submitted in partial fulfillment of the requirements

for the degree of

M.Tech. in Computer Science and Engineering, Information and Network Security

Submitted By

Aarohi Pujara

(14MCEI19)

Guided By

Dr. Ankit Thakkar

Nirma University, Ahmedabad.

Mr. Madhusudhan Srinivasan

Intel Technology India Pvt. Ltd.

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

INSTITUTE OF TECHNOLOGY

NIRMA UNIVERSITY

AHMEDABAD-382481

MAY 2016

Certificate

This is to certify that the major project entitled **"Predictive and optimal decision making for Intel's global business units with ETL processed data using MSBI"** submitted by **Aarohi Pujara (Roll No: 14MCEI19)**, towards the partial fulfillment of the requirements for the award of degree of Master of Technology in Computer Science and Engineering of of Institute of Technology, Nirma University, Ahmedabad, is the record of work carried out by her under my supervision and guidance. In my opinion, the submitted work has reached a level required for being accepted for examination. The results embodied in this project, to the best of my knowledge, haven't been submitted to any other university or institution for award of any degree or diploma.

Dr.Ankit Thakkr
Internal Guide & Assistant Professor,
CSE Department,
Institute of Technology,
Nirma University, Ahmedabad.

Dr. Sharada Valiveti
Associate Professor,
Coordinator M.Tech - CSE(INS)
Institute of Technology,
Nirma University, Ahmedabad

Dr. Sanjay Garg
Professor and Head,
CSE Department,
Institute of Technology,
Nirma University, Ahmedabad.

Dr. P. M. Tekwani
Director,
Institute of Technology,
Nirma University, Ahmedabad

Certificate

This to certify that **Miss. Aarohi Pujara (14MCEI19)**, a student of M.Tech CSE(Computer Science and Engineering), Institute of Technology, Nirma University, Ahmedabad was working in this organization since 03/06/2015 and carried out his thesis work titled **"Predictive and optimal decision making for Intel's global business units with ETL processed data using MSBI"**. She was working in name of Business Intelligence intern under supervision of Mr. Madhusudhan srinivasan (Mentor), and Mr. Udayakrishnan MB (Manager). She has successfully completed the assigned work and is allowed to submit her dissertation report. The results embodied in this project, to the best of our knowledge, haven't been submitted to any other university or institution for award of any degree or diploma. We wish her all the success in future.

Mr. Madhusudhan Srinivasan
External Guide & Project Manager,
Intel Technology India Pvt.Ltd,
Bengaluru.

Mr. Udayakrishanan MB
Manager,
Intel Technology India Pvt.Ltd
Bengaluru.

Statement of Originality

I, **Aarohi Pujara**, Roll. No. **14MCEI19**, give undertaking that the Major Project entitled "**Predictive and optimal decision making for Intel's global business units with ETL processed data using MSBI**" submitted by me, towards the partial fulfillment of the requirements for the degree of Master of Technology in **Computer Science & Engineering** of Institute of Technology, Nirma University, Ahmedabad, contains no material that has been awarded for any degree or diploma in any university or school in any territory to the best of my knowledge. It is the original work carried out by me and I give assurance that no attempt of plagiarism has been made. It contains no material that is previously published or written, except where reference has been made. I understand that in the event of any similarity found subsequently with any published work or any dissertation work elsewhere; it will result in severe disciplinary action.

_____

Signature of Student

Date:

Place:

Endorsed by

Dr. Ankit Thakkar

(Signature of Guide)

Acknowledgements

First and foremost, sincere thanks to **Mr. Udayakrishnan MB**, Manager, Intel Technology India Private Limited, Bangalore. I enjoyed his vast knowledge.

I would like to thank my Mentor, **Mr. Madhusudhan Srinivasan** and **Mr. Padmesh Mishra** , Intel Technology India Private Limited, Bangalore for his valuable guidance. Throughout the training, he has given me much valuable advice on project work. Without him, this project work would never have been completed.

It gives me immense pleasure in expressing thanks and profound gratitude to **Dr. Ankit Thakkar**, Assistant Professor, Computer Science Department, Institute of Technology, Nirma University, Ahmedabad for his valuable guidance and continual encouragement throughout this work. The appreciation and continual support he has imparted has been a great motivation to me in reaching a higher goal.

It gives me an immense pleasure to thank **Dr. Sanjay Garg**, Hon'ble Head of Computer Science and Engineering Department, Institute of Technology, Nirma University, Ahmedabad for his kind support and providing basic infrastructure and healthy research environment.

A special thank you is expressed wholeheartedly to **Dr P. M. Tekwani**, Hon'ble Director, Institute of Technology, Nirma University, Ahmedabad for the unmentionable motivation he has extended throughout course of this work.

I would like to thank the Institution, all faculty members of Computer Engineering Department, Nirma University, Ahmedabad for their special attention and suggestions towards the project work.

- Aarohi Pujara

14MCEI19

Abstract

A decision-making process is a consequential process for any organization; decisions made by Business Leaders, Program/Project Managers or higher authority executives are very crucial for the prosperity of any organization. Business direction, time saving , efficient storage and effort saving are the key outcome achievable by converting unprocessed data to information and insights. This Project aims to converting real-time raw data into consequential and subsidiary information for business analysis motive.For optimal decision making graphical representation render various report aspects like Risk Involved, Bugs (open, incoming, age of bug, bench-marking), Defects, Issues, Product Change Requests (PCRs)/ Design change request, Org Learning, Schedule tracking etc. These reports are useful for Business Leaders, analysts and Program/Project Managers to improve decision making, bringing predictability, identifying new opportunity, increase accuracy and timeliness of project / program execution.

Abbreviations

SSRS	SQL Server reporting services
SSIS	SQL Server Integration Services
SSAS	SQL Server Analysis Services
SSMS	SQL Server Management Studio
BIDS	Business Intelligence Development Studio
ETL	Extract, Transform and Load
SPBI	SharePoint Business Intelligence
CSV	Comma Seprated Values
PDF	Portable Document Format
XML	Extensible Markup Language
HTTP	Hypertext transport protocol
SQL	Structured query language
HSD	High Speed Database
UX	User Experience
LAN	Local Area Network
WLAN	Wireless Local Area Network
BAT	Batch file
DB	Database
MSBI	Microsoft Business Intelligence
OS	Operating System
GB	Giga Byte
TB	Tera Byte
GHz	Giga Hertz
SSD	Solid state drive
HDD	Hard disk drive

Contents

List of Figures

List of Tables

Chapter 1

Introduction

1.1 Overview

Despite the relative down time in software market,the need and requirements for business intelligence application continues to increase. [1].Business growth,precise,time saving and effort saving are the key outcome achievable by converting raw data to information and insights. This process aims to convert real-time raw data into consequential and subsidiary information for business analysis motive.

To make business decisions easier and faster this project has created various reports like active Risk management (identification, tracking, mitigation, closure), Bugs/Issues (open, incoming, age of bug, bench-marking), Product Change Request (PCRs)/ Design change request, Org Learning, Schedule tracking, Regression indicators etc.

SSRS is used to create front end BI reports, the raw data will be pull from SQL server/SSAS. Multiple ETL jobs are created to process the raw data. These reports are hosted on and publish them on Intel's SPBI Website, the reports are seamlessly integrated to align with Intel's SSO policy. The reports adhere to Intel's UX guidelines. The entire report development follows scrum development methodology.The key area in this process is to get optimised query and performance for end reports.

These reports are useful for Business Leaders, analysts and Program/Project Managers to improve decision making, bringing predictability, identifying new opportunity, increase accuracy and timeliness of project/program execution.

Chapter 2

Literature Survey

2.1 Motivation

The term Business Intelligence may turn out to be a fad. However, the underlying concepts remain the same, BI systems combine data gathering, data storage, and knowledge management with analytical tools to present complex internal and competitive information to planners and decision makers. [1]. A decision-making process is a consequential process for any organization; Prosperity of any organization depends upon the crucial decisions made by the business Leaders, Program/Project Managers or higher authority executives.

2.2 Significance

Strategy to gain deeper , richer , and more accurate insights into customers , partners , business units and ultimately the competitive advantage is provided Business Intelligence. It involves developing processes and systems that amass, transforms, cleanse and consolidate organization wide and external data, generally in an accessible store (a data warehouse or a database), presented to users as reports or dashboards.[2]

Multiple global manufacturing units in Intel are causing a tsunami of data growth. In addition to it Intel has multiple business units and diverse need for data mining and data driven decision making .[3] Most of these data are unstructured and thus unproductive. Business Intelligence helps to convert these data assets into meaningful and improved management processes.Query optimization is key to the faster and better performance in Business intelligence.

spreadsheet is very common and popular way of presenting the data. for tracking activities, bugs/issues, validation, verification, etc. activities fro small/less complex projects,spreadsheet can be a very less complex and obvious solution. But Intel's business processes are very complex and spreadsheet way of maintaining is labor intensive and error prone.In addition,spreadsheet does not have the mechanism to refresh the data.this kills the whole idea behind the dynamic SSRS reports.

2.3 Assumptions

Kerberos based authentication for single sign-on is enabled in organization. The reports have role based authentication and authorization enabled to work in conjunction with Intels Active Directory roles and Enterprise Digital Rights Managements technology. Single sign on provides transperency.

2.4 Limitations

- Intel's SPBI 2013 environment only supports for Internet Explorer web browser. SRRS reports are keep on loading in Chrome and Mozilla Firefox web browsers.
- No suuport available for the Mobile and Tablets for SSRS.
- Frequency of executing the SQL jobs can not be less than 3 minutes. Because it creates increase load on the current SQL server environment.
- with growth of the scale of reports,SPBI 2013 tends compromise the performance.

2.5 Delimitation

- Continuous feedback from end user will be taken as it follows scrum process model.

Chapter 3

Objectives

3.1 Objectives

- Gathering the real time raw-data from different data sources
  - Various Business units produces the real time raw-data from different data sources. Since the data sources are located on different servers spread across GEO.
- Since the data sources are located on different servers,they tend to have been stored in different formats. So there are different ETL jobs available to process the data into the Business unit's Server
  - Since the database server is located on different servers across different GEO, so time taken by queries to retrieve data would become much more.
  - the time taken by SSIS packages(ETL jobs) entirely depends upon the size of the data source.[4]
- Query Optimization
  - Database contains millions of records, and time required to pull that data must be as less as possible. Optimization cab be achieved in the way in which we perform joins which fetches data from multiple tables, types of Hints, indexing methods etc.
  - Query optimization also means fetching very specific and relevant data for the SSRS reports.

- Query processing on the database
  - Extracting meaningful data on business leader's requirements so it will become valuable information.
- Designing and creating the report via SSRS[5] based on the requirements.
  - data should be represented in such a way that it must be user friendly in nature, Quick to get the desired data, as well as they must be able to take quick and accurate decision by looking at the report.
- Deployment of the reports onto the SPBI Website
  - To deploy these report onto SPBI developer site make it easy to share with as many people as they want, and main advantage is that they always get refreshed data at any time. Also based on the role of the user we can give credentials for specified user. Security of the data can be managed with the credentials.
- On user defined time, Users will be get notified by the email subscription.

Chapter 4

Technical Requirements

4.1 Technical Requirements

Table 4.1: Development Tools

Tool	**Version**
SSMS	10.50.1600.1
BIDS	0.0.30729.4462 QFE
SPBI	2010 and 2013

Table 4.2: Server Configuration

Processor	Intel(R) Xeon(R) X5670 CPU @2.93 GHz
RAM	4.00 GB
OS	Windows Server Enterprise
System type	64 bit OS
HDD	1 TB
Name	Version

Table 4.3: Development Environment

Processor	Intel(R) Core(TM) i5-2520M CPU @2.50 GHz
RAM	4.00 GB
OS	Windows 8
System type	64 bit OS
SSD	110 GB
Browser	**Version**
Internet Explorer	10.0.9200.17116
Google Chrome	0.0.30729.4462 QFE
Mozilla Firefox	IE-10.0.9200.17116

Chapter 5

Data requirements and sources identified

5.1 Data requirements and sources identified

Each and every business units are using different types of data-sources, based on the requirements we are using real-time raw data from,

- Intel's relational databases located at different geo's
- Internally/third-party developed tools
- Excel files created by employees,
- XML files generated from automated tools,
- CSV files generated from online automated query,
- NoSQL databases.

Chapter 6

Scope of the project

This Project collects the real-time raw-data from Intel's relational databases spread across different geo's, various other Intel's data repositories, Microsoft Excel Spread sheets, xml, internally/third-party developed tools, excel files created by employees. faceless account is used by projects to pull the data as per Intel's information security policies(Faceless account don't requires password too be changed at regular interval). Faceless account has right level of authorization/authentication enable on source as well as destination server.

ETL jobs are executed using SSIS packages and scheduled at predefined intervals.ETL jobs are used to get updated data at regular interval of time. SSRS reports are accessed via browsers. SSRS is used to represent the data in a very meaningful way as per Intel's UX (User Experience) standard. SSRS report will be created using BIDS 2008 or microsoft report builder 3.0.

SSRS reports are deployed on to the Microsoft SPBI 2010/2013 which will use Single Sign On (SSO) to work seamlessly across this product suite and provide intuitive navigation and Enterprise digital rights managements technology.

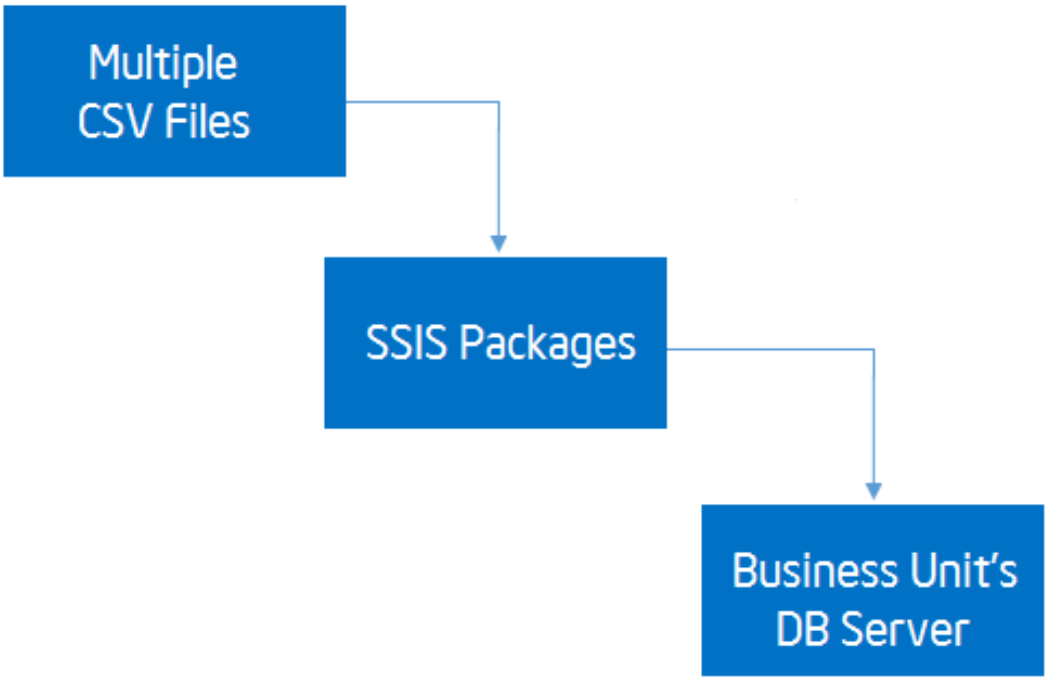
customize email notification are send to report end users as per their desired frequency. Report needs to load within 5 and 10 seconds in LAN and WLAN environment respectively according to Intel's UX Standard.

Chapter 7

Implementation

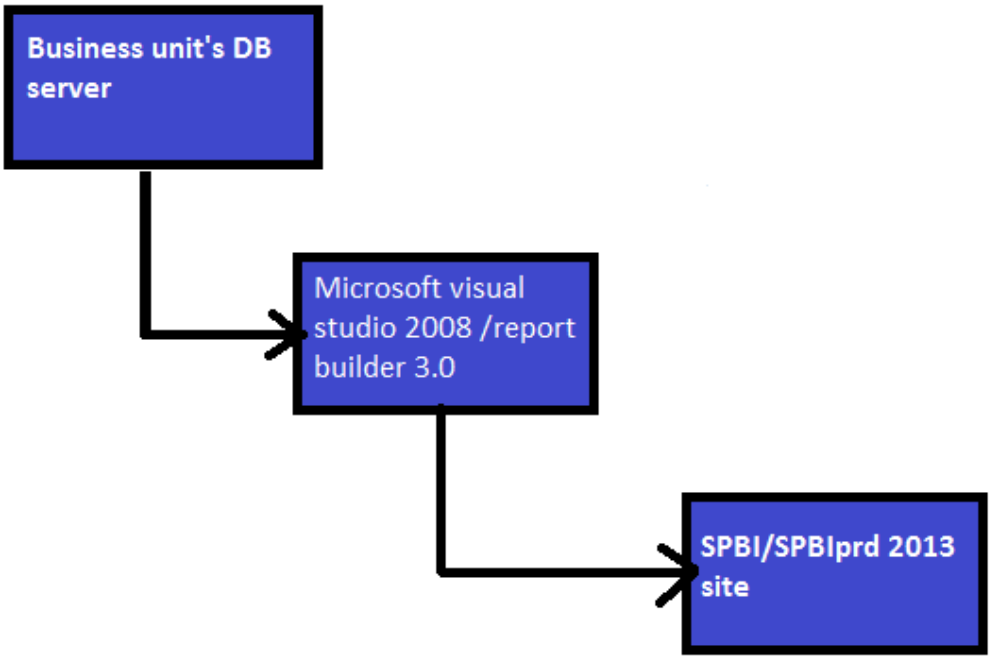
It extracts the data from spread sheets, xml data source,other internal data source, csv data files and high speed database via SSIS and loads into to respective Business unit SQL server. Manual work is explained in figure 7.1.this is covered in future scope.Current work is limited to generating optimized and efficient SSRS reports for various projects going on in intel.Below image provides the overall idea about the current scope of work.

Figure 7.1: Manual Work



Let's take example of Dashboard for all respective business units and their projects . It will extract the data from these multiple CSV files via SSIS Package. SSIS package will store the data into the business unit's database Server for quickly accessing the data.

Figure 7.2: Automated Work



Once we get the refreshed data in business unit's Server, We are able to retrieve required data through SQL simultaneously applying query optimization techniques for reducing the time latency.

few sql query optimization standard preactises are listed below.

1. By using the actual column names in SELECT statement instead of than '*' ,the sql query can become faster.
   For Example: Write the query as:
   (a) $SELECTid, first_name, last_name, ageFROMstudent$;
   instead of :
   (b) $SELECT * FROMstudent$;
2. once the rows are selected,HAVING clause used to fliter them. It is just like a filter. Do not use HAVING clause for any other purposes.
   For Example: Write the query as:

(a) $SELECTsubject, count(subject)FROMstudentWHEREsubject! =' Science'ANDsubject$
$Maths'GROUPBYsubject$;
instead of:

(b) $SELECTsubject, count(subject)FROMstudentGROUPBYsubjectHAVINGsubject! ='$
$Vancouver'ANDsubject! =' Toronto'$;

3. Sometimes you may have more than one subqueries in your main query. Try to minimize the number of subquery block in your query.
For Example: Write the query as:

(a) $SELECTnameFROMemployeeWHERE(salary, age) = (SELECTMAX(salary), MAX$
$Electronics'$;
instead of:

(b) $SELECTnameFROMemployeeWHEREsalary = (SELECTMAX(salary)FROMempl$
$(SELECTMAX(age)FROMemployee_details)ANDdept =' Electronics'$;

4. Use operator EXISTS, IN and table joins appropriately in your query.

(a) Usually IN has the slowest performance.

(b) IN is efficient when most of the filter criteria is in the sub-query.

(c) EXISTS is efficient when most of the filter criteria is in the main query.
For Example: Write the query as:

i. $Select*fromproductpwhereEXISTS(select*fromorder_itemsowhereo.product_id =$
$p.product_id)$;
instead of :

ii. $Select*fromproductpwhereproduct_idINselectproduct_idfromorder_items$;

5. Use EXISTS instead of DISTINCT when using joins which involves tables having one-to-many relationship.
For Example: Write the query as:

(a) $SELECTd.dept_id, d.deptFROMdeptdWHEREEXISTS(SELECT'X'FROMemployeee$
$d.dept)$;
instead of :

(b) $SELECTDISTINCTd.dept_id, d.deptFROMdeptd, employeeeWHEREe.dept = e.dept$;

6. Try to use UNION ALL in place of UNION.

   For Example: Write the query as:

   (a) $SELECTid, first_name FROM student_details_class10 UNION ALL SELECTid, first_name$ instead of:

   (b) $SELECTid, first_name, subject FROM student_details_class10 UNION SELECTid, first_n$

7. Be careful while using conditions in WHERE clause.

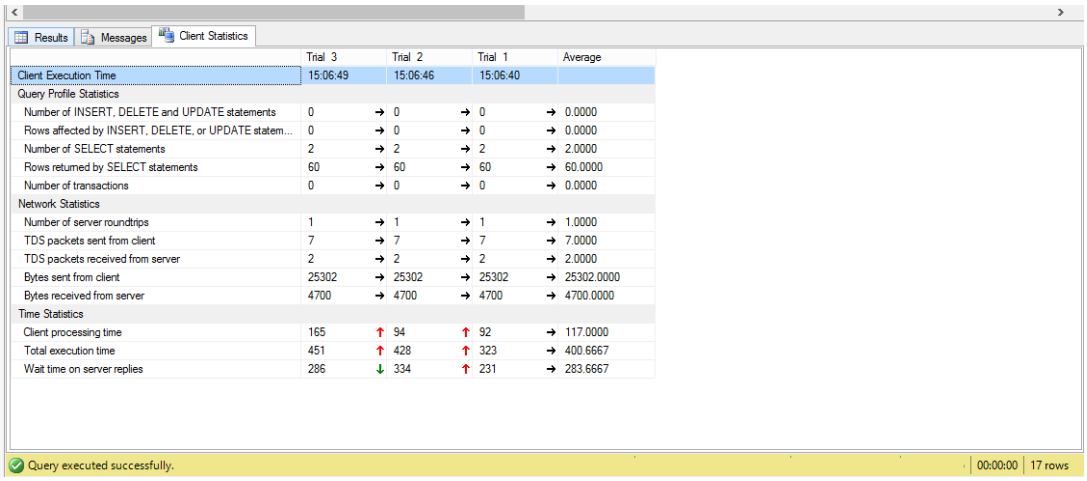
   For Example: Write the query as:

   (a) $SELECTid, first_name, age FROM student_details WHERE age > 10$; instead of :

   (b) $SELECTid, first_name, age FROM student_details WHERE age! = 10$;

Query execution time is shown in figure 7.3.

Figure 7.3: Query Execution time

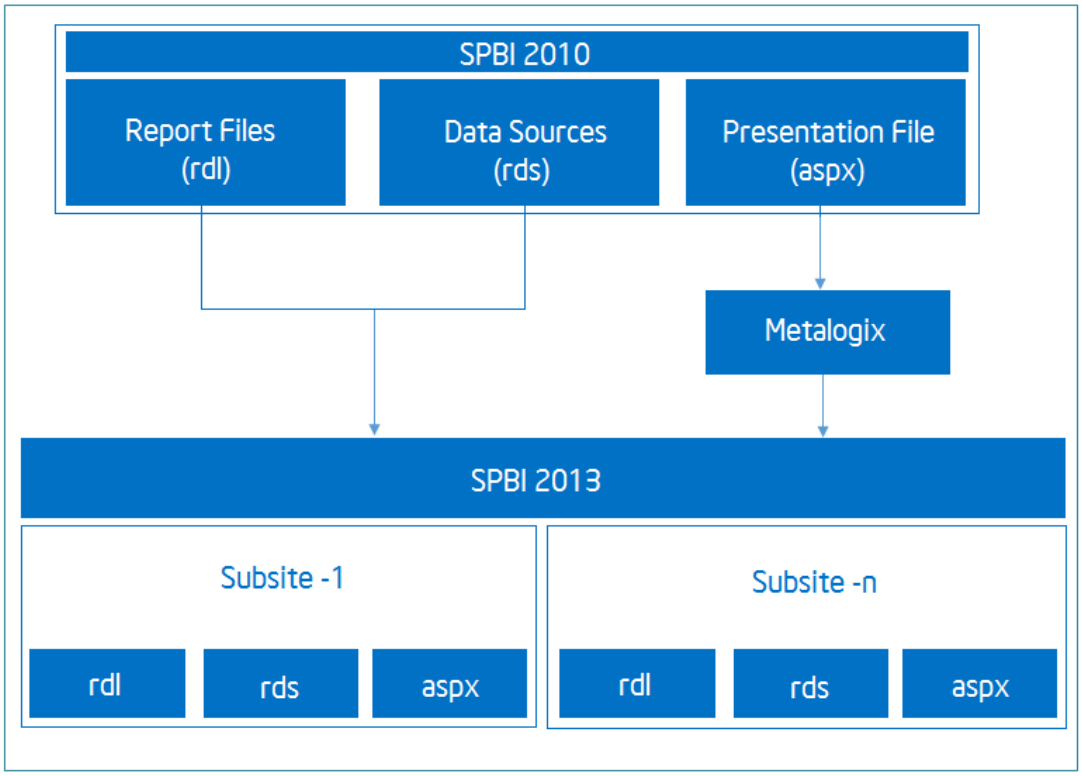


Then we are rendering the data via SSRS reports in such a way that it must be user friendly, as well as our customers and stakeholders must be able to take quick and accurate decision by looking at the report.

Now to deploy the report on to the SPBI site we used the SPBI, BIDS/ Online Report Builder and Single sign (SSO) on mechanism for deployment and accessing the reports. Reports can be exported to XML, CSV, PDF, Excel, Word format.

For maintaining the content for particular business units according to Intel's UX standard we need to migrate the existing SPBI 2010 to SPBI 2013 shown in figure 7.4.

Figure 7.4: SPBI 2010 to 2013 Migration



It includes Following steps.

Step 1. Moving the report files (rdl)

Step 2. Moving the data source files (rds)

Step 3. Linking the data source and report files

Step 4. Enter the credentials of user for particular database in the data source files.

step 5. Linking the aspx pages and report files

step 6. Data Validation and Verification Process

Step 7. UX testing according to Intel's UX standard

when we move the aspx pages from SPBI 2010 to SPBI 2013 it will vanish the all the content. In-order to migrate aspx pages without vanishing the content intel higher authority person used Metalogix [6] tool. Input for Mealogix is source folder path and destination folder path for aspx pages.

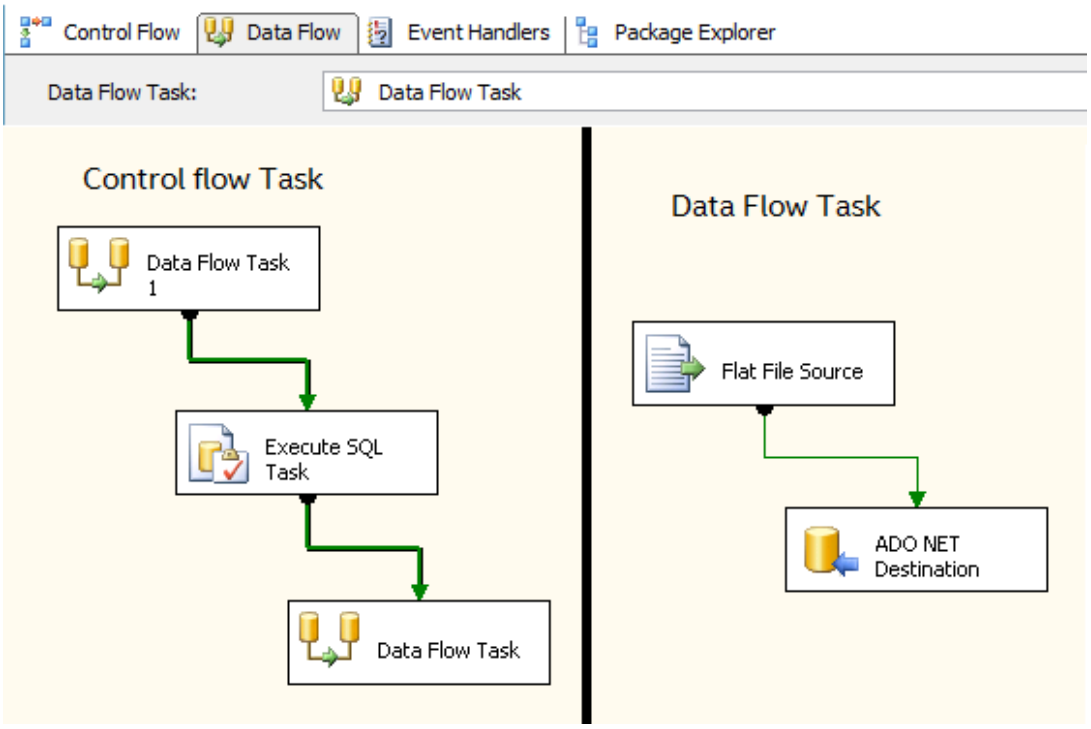
Chapter 8

Working with SSIS and SQL Job Agent

SSIS is used to fetch data from multiple sources and store it at one common destination which is a table in our case. The working methodology has been explained below:

8.1 SSIS Package Creation

Figure 8.1: SSIS Package



- Open Visual Studio 2008, go to file, click New and Select Integration Services

Project.Give name of the project as per Intel's nomenclature.

- Select the data flow task from control flow items.
- Select the data flow source items from data flow task. There can be multiple different source items. Select the data flow transformation items from data flow task. There can be different multiple transformation items. Select the data flow destination item from data flow task.
- As shown in figure 8.1, We selected flat file source and ADO.Net destination. In data flow task we used data flow task then execute SQL task to delete the data fro table and then data flow task. The idea of adding multiple times data flow task task is, if we don't have the file in source folder it will not delete the data from table.
- In the deployment settings, Set the *CreateDeploymentUtility = True*, For generating the *SSIS packages* and *.manifest* file in bin folder.

8.2 Deployment of SSIS Package

- Open the *.manifest* file from the bin directory. This will run the package installation wizard.
- Select the deployment type as SQL server deployment. Enter the Server Details and destination folder.

8.3 Creating SQL Job

- As shown in figure 8.2, Create a connection to SQL server and Create a new SQL job by right clicking on the Job directory.
- Enter general details of the job as shown in figure 8.3. Create steps to execute. Select type of step as SQL server integration service package.
- Enter the Server details and Select the SSIS package form the deployment folder
- Now, schedule the job on user defined frequency and time as shown in figure 8.4.
- Set the email notification to the user when job fails or succeeds,as shown in figure 8.5.

Figure 8.2: SQL Job Wizard

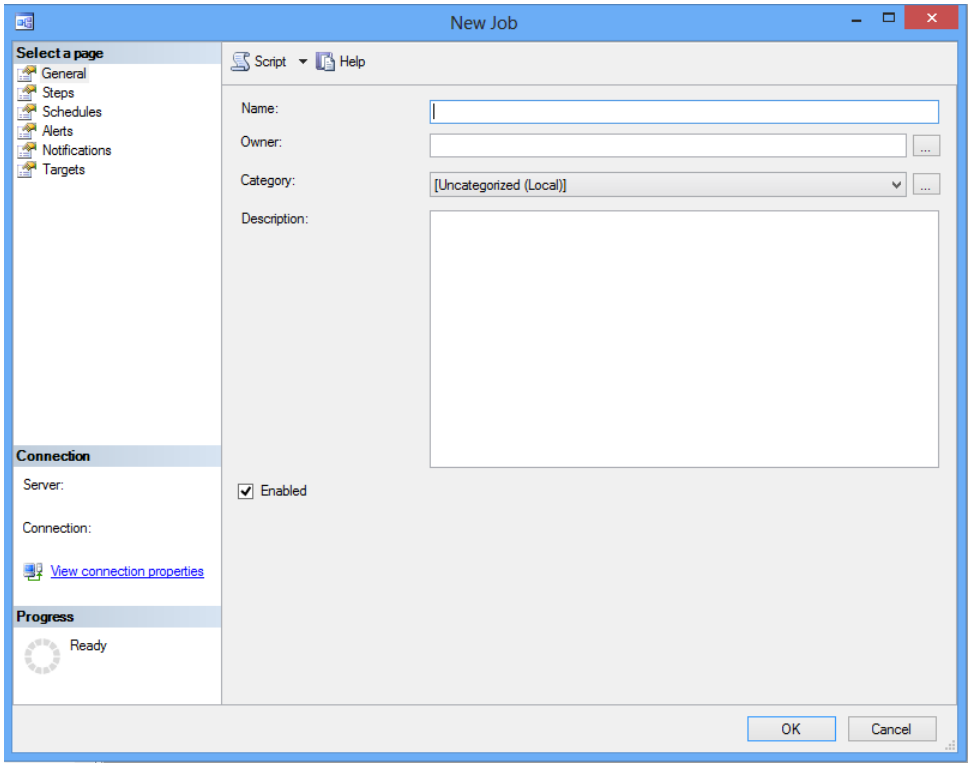


Figure 8.3: Creating Step

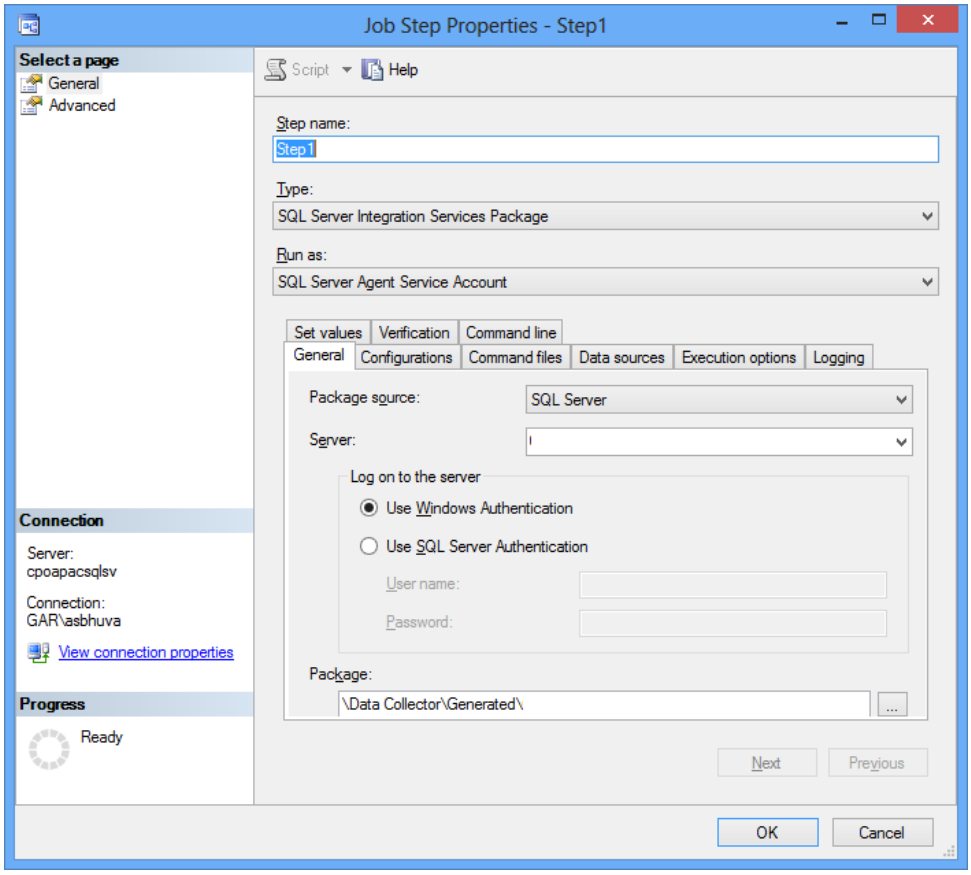


Figure 8.4: Scheduling Job

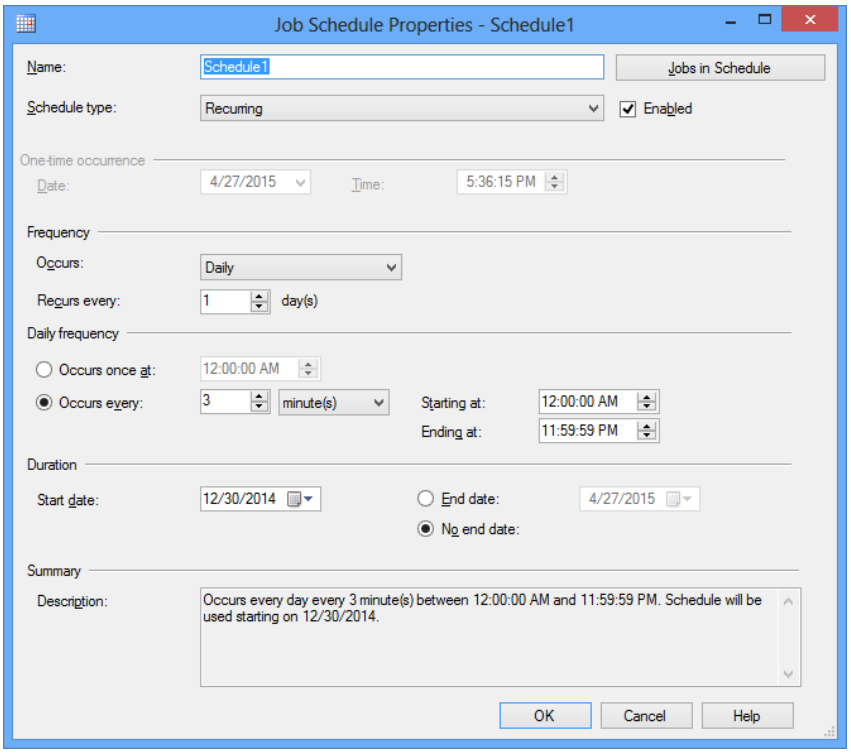
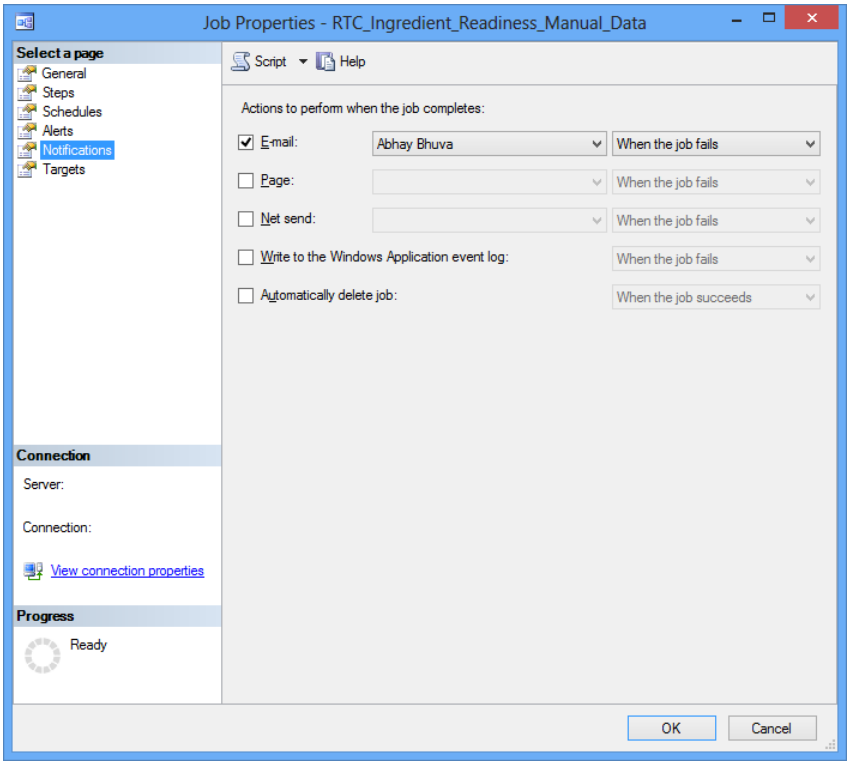


Figure 8.5: Email Notification

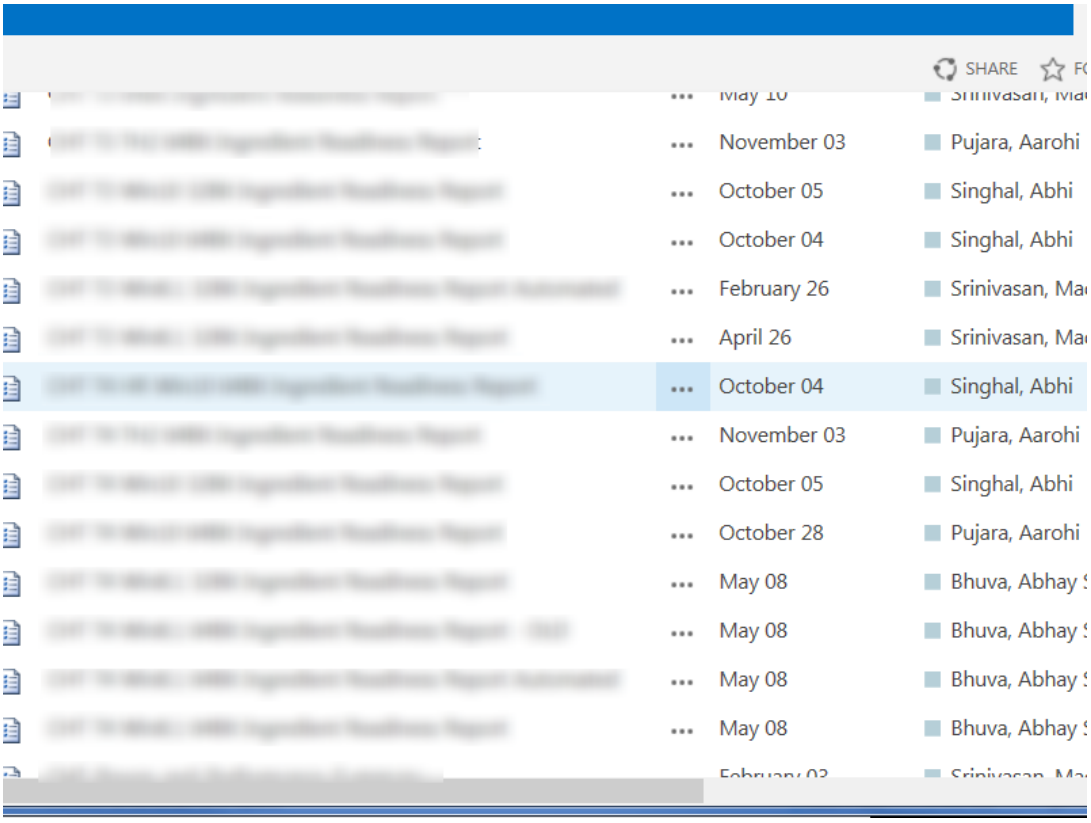


Chapter 9

Results

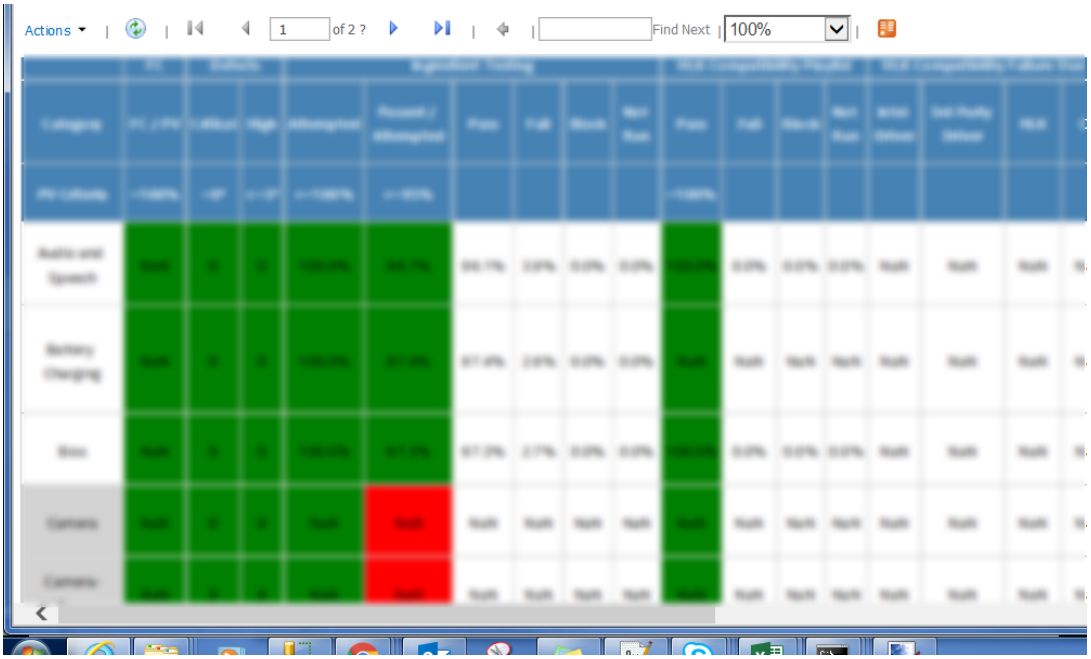
9.1 Portable Device Group

Figure 9.1: Portable Device Group



The Portable Device Group dashboard is a first of its kind in Intel that has tremendously boosted productivity in Mobile Segment.Its stepping stone for intel in Mobile world. It integrates multiple indicators for different OS with different versions in single view.It combines the data from multiple sources from various groups.This gives them one

Figure 9.2: Portable Device Group

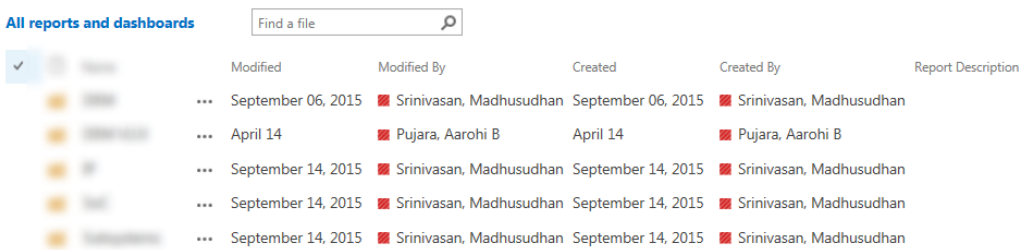


live version of the truth and eliminates the need for offline PowerPoint presentations. In the past they had to rely on multiple redundant or state versions of program status. This live dashboard eliminates inaccuracy and data redundancy. In a complete program where there are multiple variants this is extremely helpful to make quick and correct decisions.

9.2 10nm Technology

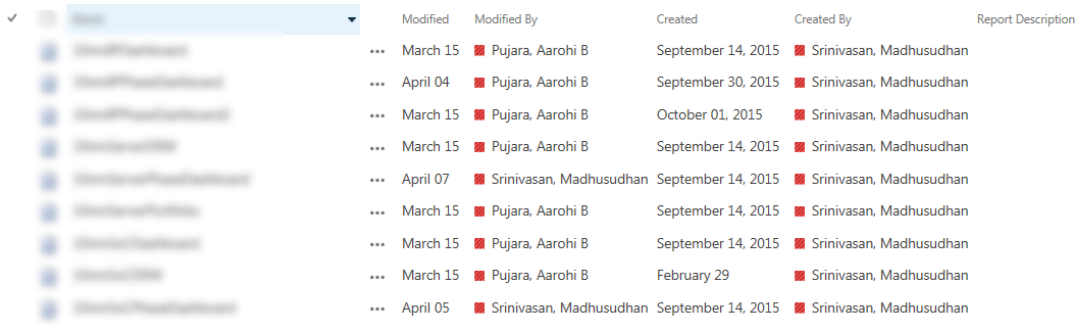
10 nm node is successor after 14nm node in intel continuous success journey to deliver best node in semiconductor fabrication industries.Intel is working on making it commercialize it .There following 4 major areas under this 10nm where i have created indicators for that.

Figure 9.3: 10nm - Main Dashboard



- SOC - this folder contains all indicators which shows all SOC's and its related release dates and all other intermediate dates with slips and deltas.

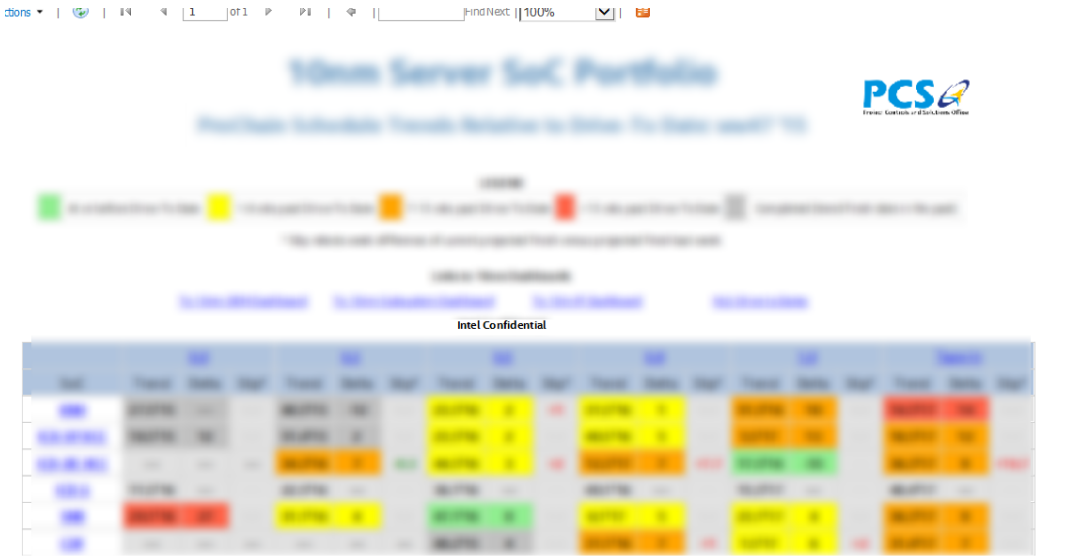
Figure 9.4: 10nm - SOC - Main Dashboard



	Modified	Modified By	Created	Created By	Report Description
	March 15	Pujara, Aarohi B	September 14, 2015	Srinivasan, Madhusudhan	
	April 04	Pujara, Aarohi B	September 30, 2015	Srinivasan, Madhusudhan	
	March 15	Pujara, Aarohi B	October 01, 2015	Srinivasan, Madhusudhan	
	March 15	Pujara, Aarohi B	September 14, 2015	Srinivasan, Madhusudhan	
	April 07	Srinivasan, Madhusudhan	September 14, 2015	Srinivasan, Madhusudhan	
	March 15	Pujara, Aarohi B	September 14, 2015	Srinivasan, Madhusudhan	
	March 15	Pujara, Aarohi B	September 14, 2015	Srinivasan, Madhusudhan	
	March 15	Pujara, Aarohi B	February 29	Srinivasan, Madhusudhan	
	April 05	Srinivasan, Madhusudhan	September 14, 2015	Srinivasan, Madhusudhan	

Below Two snapshots are of some of the reports from SOC folder.These reports gives insight on how other reports are also been created in the same folder ,keeping customer requirement and feedback in mind.

Figure 9.5: 10nm - SOC - report



- Dem - its monitor for die. following are the screenshot which shows main dashboard for DEM'S and some of the reports inside it.

  Following are the some of reports from the DEM folder showing how we have incorporated the customer requirements .

Figure 9.6: 10nm - SOC - report drill-down

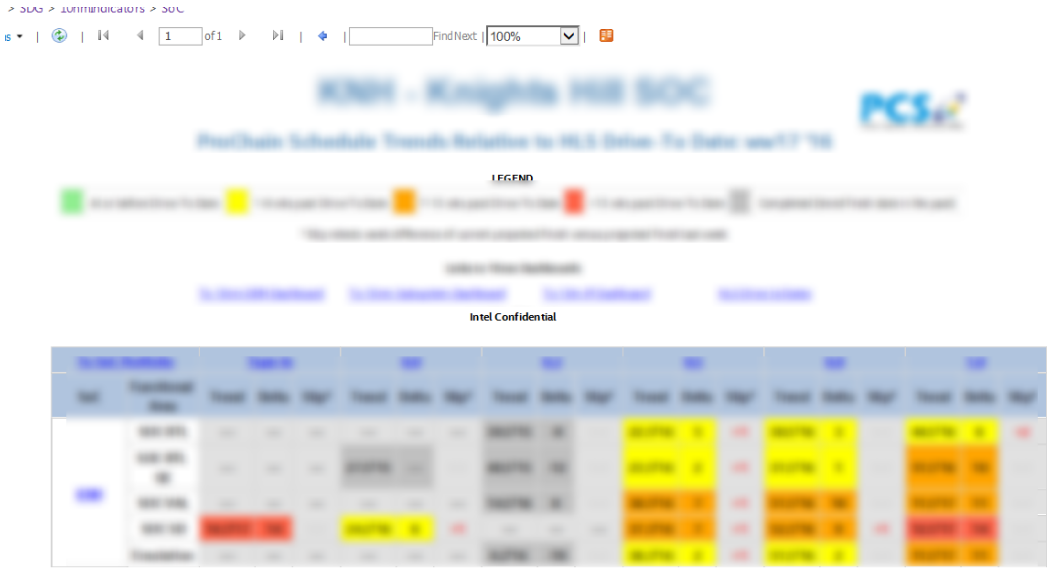


Figure 9.7: 10nm - DEM - Main Dashboard

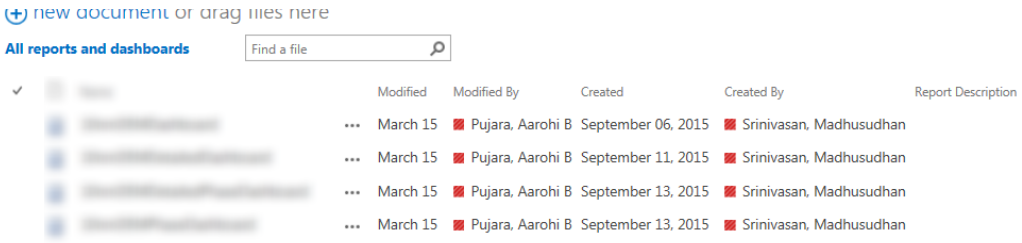


Figure 9.8: 10nm - DEM - Report

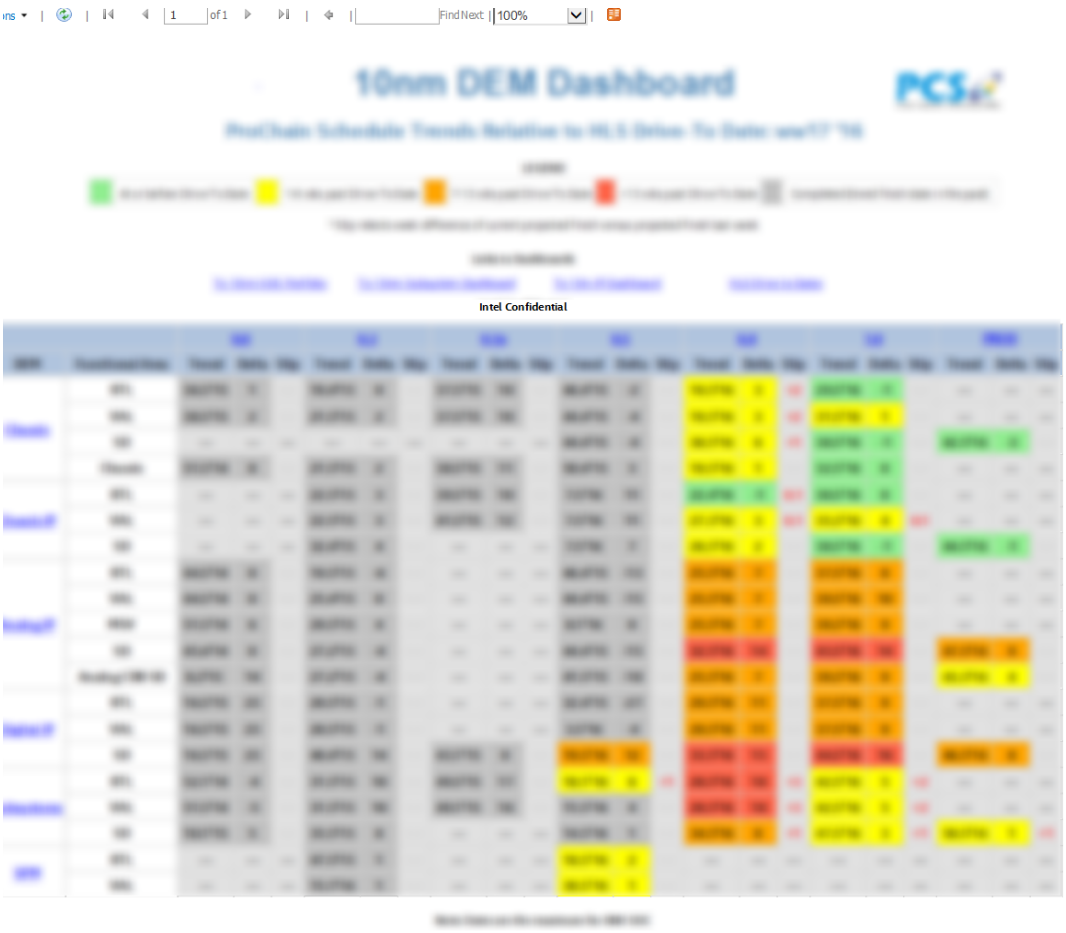
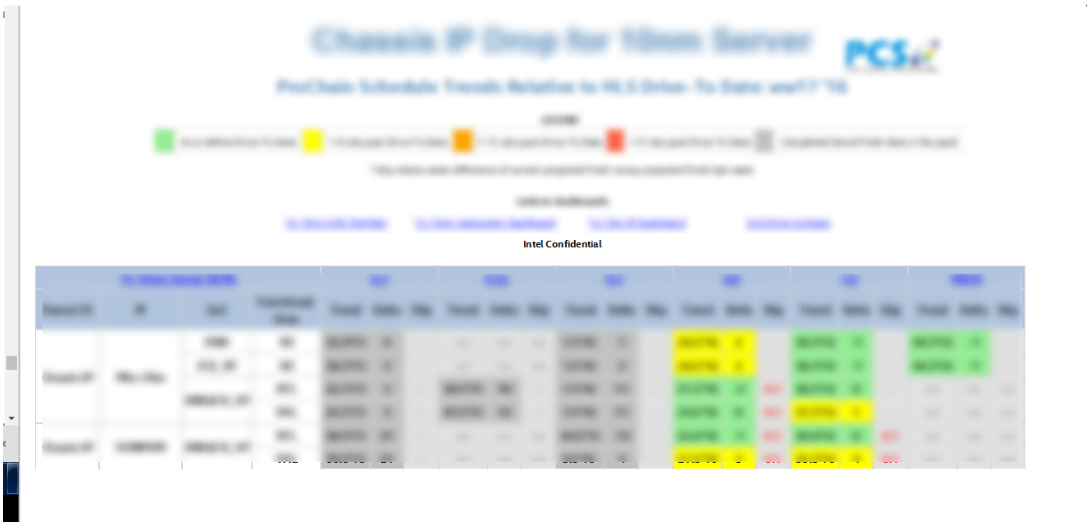
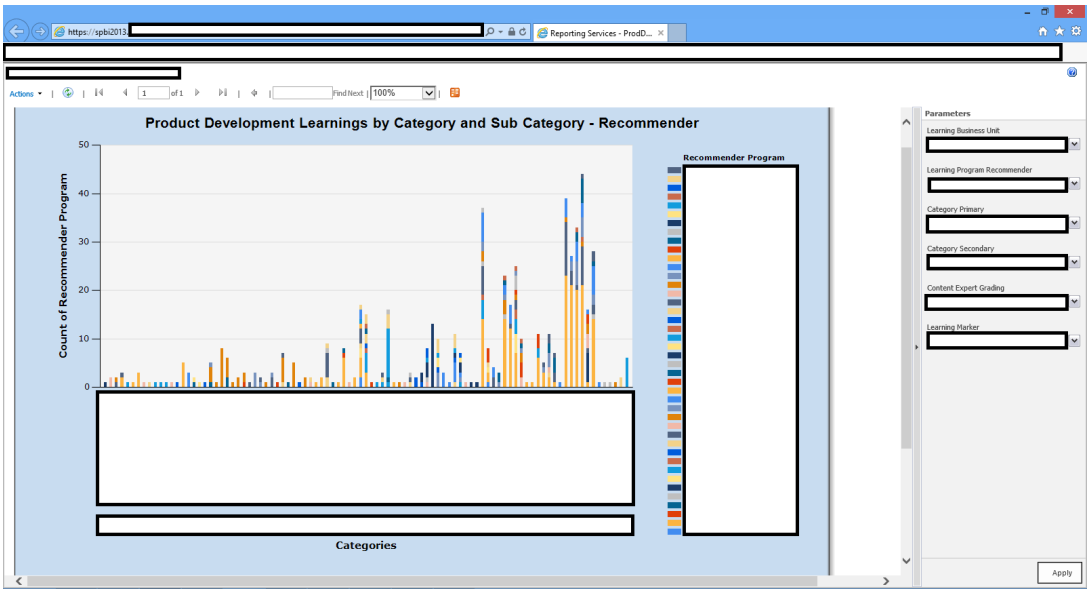


Figure 9.9: 10nm - DEM - Report - drill down



9.3 Organization Learning Dashboard

Figure 9.10: Organization Learning Dashboard



Intel is in semiconductor industry since 1968. All the business units capture their learnings for developing the product once the project is over. Idea is to analyze these learnings for future products which increases the productivity and decreases the development time and efforts.

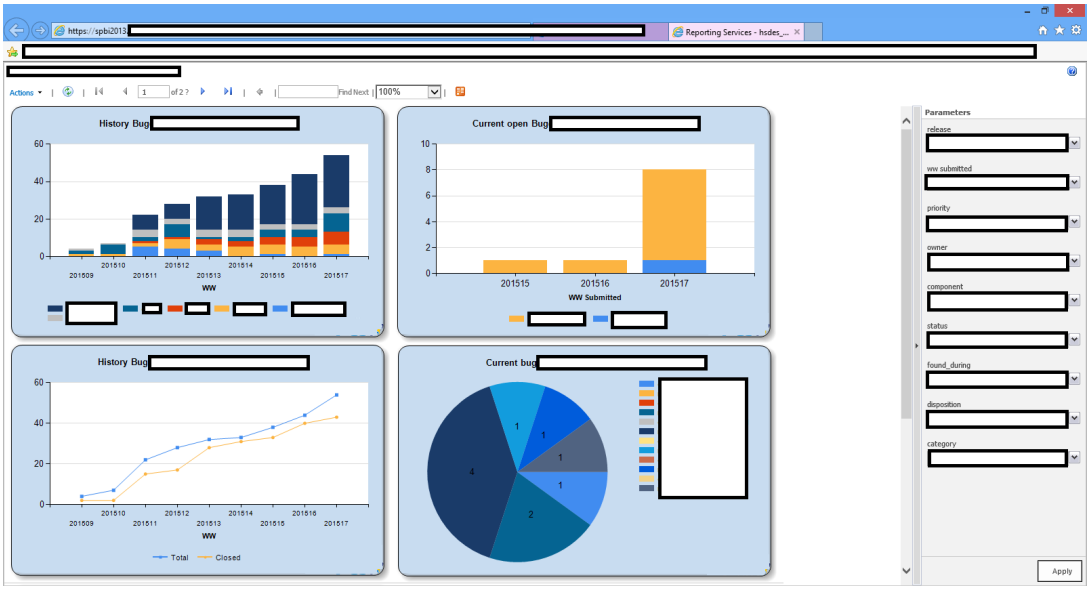
The analytics of learnings are provided by Organization learning dashboard to help development teams to improve their practices.

After selecting the particular business unit's learning from the relevant parameter , the selection of the Learning program for particular program, Primary and Secondary category of the learning can be done. Based on the above criteria it will automatically select the content-Expert Grading and Learning Marker. By clicking on the bar graph, user will be drill-down to particular learning. They can export the data in excel, XML, CSV, TIFF, word and PDF files.

9.4 Bug and PCR Dashboard

To understand current trend of ongoing project,Project manager uses bug and PCR indicators which helps organization to view information out of unstructured and structured raw data, helps to understand the current status of the project and identify problems in current trend from which they can make right decisions to for future roadmap to achieve

Figure 9.11: Bug Dashboard



milestones on time.

The Bug and PCR dashboards give a keen comparative trend analysis of bugs and PCR. It led in a work week and breakup of all bugs in terms of their status. Status of bugs can be open, closed, rejected, etc.

The PCR dashboard gives the information about the change request for the products.

9.5 Protection Chart

Project manager uses protection chart to track project time-line, task start and end time, task movement, and current status of milestones based on projects.

Green area indicate that project is on track and will complete on time. yellow area indicate that project is on track but team has less buffer available. Red area indicate that project is not on track.

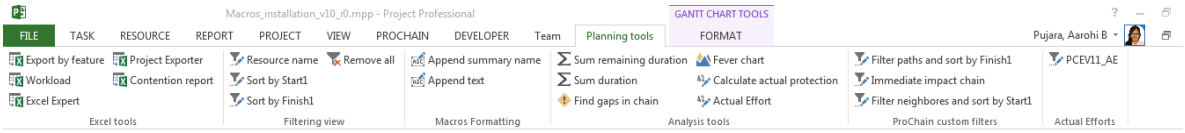
This mechanism enables the project analyst to provide the better approach to project lead for further progress in the project.

9.6 IDC Planning toolbar

This is customised Toolbar which is added in Microsoft project 2013. Its purpose is to have multiple macros for various functionality. these toolbar is added to provide extra

Figure 9.12: Protection Chart

Figure 9.13: IDC Planning toolbar



functionalty which is not provided bhy the MICROSOFT Project 2013.

It helps individual program analyst to have better schedule , better visualization of the timeline , automation of updating the sheets related to the programme. this toolbar can do the following :

- Excel Tools
  - Export by Feature - this the macro which transfers the deatils to excel filtering according to the features.
  - Workload -It provides a full picture of the projecttwo dimension project analysis and a needle in the haystack.
  - Excel expert - VBA tool which transfers information from project into excel, help you present and save data each week for Plan follow up easy way to see changes from week to week and can be used to draw actual duration data.
  - Project Exporter- The macro exports project files to excel, works directly

from the client, showing for each resource his work plan by task name, in daily resolution.

- Formatting views
  - sort by finish1 - This macro sorts the tasks by projected finish1 date
  - sort by start1 - This macro sorts the tasks by projected Start1 date
- reut's macros formatting
  - AppendSummaryNameToTask - Appends Summary name to tasks inside that summary, including the buffers. Doesn't change summary tasks. Select the tasks you want to apply Macro to, and run the macro.No Undo!
  - TextAppendToName - Appends specific text provided by the user (prompts a pop-up box) to the names of selected tasks, including the buffers. No Undo!

9.7 Excel TO MSP integration

- Excel file

  Pulls data from customised databsed designed specifically for intel.Calculates implied remaining durations.Contains the WW macro (with some added formats) in Module1.Contains the "unfilter" macro that is called from MSP

- MSP File

  The macro needs to be in your production schedule file.The sub openxls in the '—-import' module does it all.Open the Excel file and run the unfilter macro nd ensures table is unfiltered.UID, remaining duration, finish WW.Copies the 3 columns into an array.Quits Excel.Searches for each UID in the array and writes the remaining duration into the Remaining Duration column, and the Finish WW into the Status Comment column

- weekly we have to change the status date in our excel file and accordingly we have to run our macro weekly to get updated schedule.

Figure 9.14: Excel TO MSP Integration

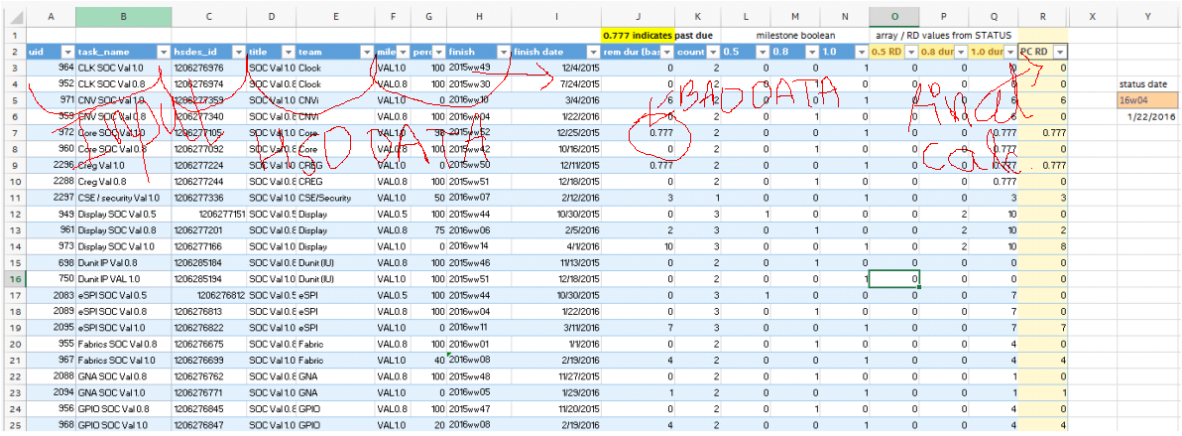
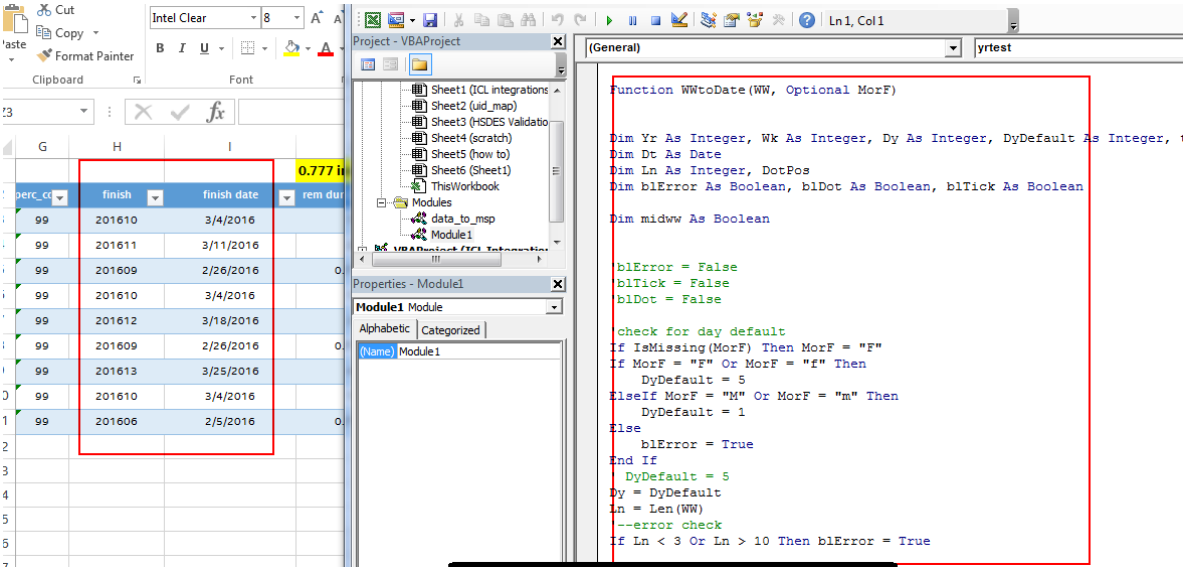
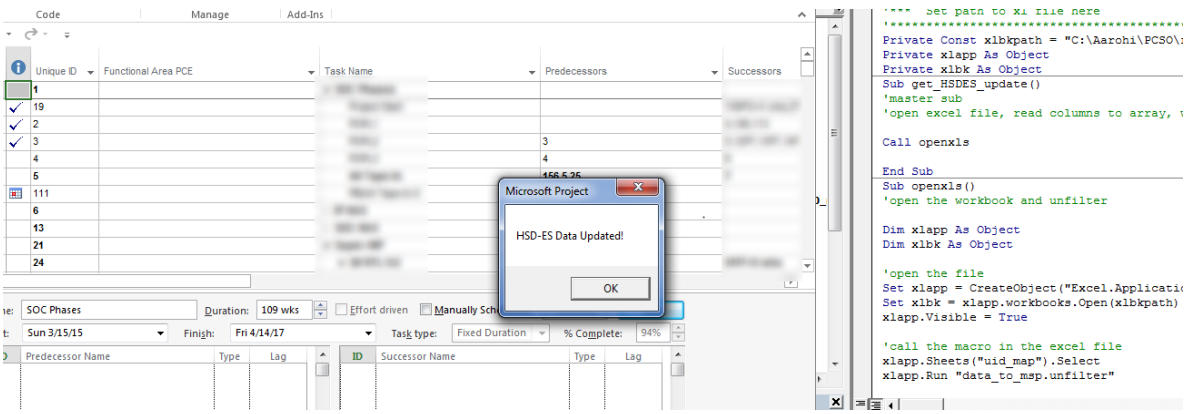


Figure 9.15: Excel TO MSP Integration



```
Function WWtoDate(WW, Optional MorF)


Dim Yr As Integer, Wk As Integer, Dy As Integer, DyDefault As Integer,
Dim Dt As Date
Dim Ln As Integer, DotPos
Dim blError As Boolean, blDot As Boolean, blTick As Boolean

Dim midww As Boolean


'blError = False
'blTick = False
'blDot = False

'check for day default
If IsMissing(MorF) Then MorF = "F"
If MorF = "F" Or MorF = "f" Then
    DyDefault = 5
ElseIf MorF = "M" Or MorF = "m" Then
    DyDefault = 1
Else
    blError = True
End If
  DyDefault = 5
Dy = DyDefault
Ln = Len(WW)
'--error check
If Ln < 3 Or Ln > 10 Then blError = True
```

Figure 9.16: Excel TO MSP Integration



```
'****  Set path to xl file here
'*****************************************
Private Const xlbkpath = "C:\Aarohi\PCSO\
Private xlapp As Object
Private xlbk As Object
Sub get_HSDES_update()
'master sub
'open excel file, read columns to array,

Call openxls

End Sub
Sub openxls()
'open the workbook and unfilter

Dim xlapp As Object
Dim xlbk As Object

'open the file
Set xlapp = CreateObject("Excel.Applicati
Set xlbk = xlapp.workbooks.Open(xlbkpath)
xlapp.Visible = True

'call the macro in the excel file
xlapp.Sheets("uid_map").Select
xlapp.Run "data_to_msp.unfilter"
```

Chapter 10

Conclusion

The intelligent dashboards has tremendously boosted productivity, reduce development costs, reduce information bottlenecks, made data actionable, emphasizing low-risk investments and align the organization towards its business objectives. Integrates the different program tools - progress tracking, requirement management, defect, bugs, PCR tracking, legal requirements and key performance indicators into one single view. this removes the need for the offline excel sheets , which is labor oriented work. In the past they had to rely on multiple redundant or state versions of program status. These live dashboards eliminates inaccuracy and data redundancy. With all these advantages ,there is little catch which performance latency in live environment,which can controlled to many extent with proper query optimization and ETL jobs.

References

[1] I. internal resources.

[2] http://www.cimaglobal.com/Documents/Thought-leadership-docs/cid-execrep-unlocking-businessintelligence Oct09.pdf.

[3] I. C. S. http://www.intc.com/corpInfo.cfm.

[4] S. Online Available at http://technet.microsoft.com/en us/library/ms141026.aspx.

[5] S. Online available at http://msdn.microsoft.com/en us/library/ms159106.aspx.

[6] M. Online Available at http://www.metalogix.com/Products/Migration Expert.aspx.