



**MANIPAL INSTITUTE OF TECHNOLOGY**  
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**MANIPAL - 576 104, KARNATAKA, INDIA**



**Industrial Training**  
**On**  
**MCS India Delivery Dashboard**

**SUBMITTED**

**BY**

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## 1. ABSTRACT

In Management Information Systems a Dashboard is defined as an easy to read, real-time user interface, showing a graphical presentation of the current status and historical trends of an organization's Key Performance Indicators (KPIs) to enable instantaneous and informed decisions to be made at a glance. It is a visual display of the most important information needed to achieve one or more objectives; consolidated and arranged on a single screen so the information can be monitored at a glance.

The MCS India Delivery Dashboard aims to provide a unified view of the overall health of the delivery process at Microsoft Consulting Services (MCS), India. The main goals of the dashboard were:

- To provide a customer centric delivery tracking and management view.
- Enable strategic decision making.
- Integration of financial, customer, process and people.
- Enable "Balanced scorecard" through metric based reports.
- Provide personalized view based on the user roles.

In order to achieve the above goals, the concept of a balanced scorecard from the article "*The Balanced Scorecard-Measures that Drive Performance*" by Robert S Kaplan and David P Norton of The Harvard Business Review has been adopted in this project. In addition, Stephen Few's Design Principles as mentioned in his book "*Information Dashboard Design*" has been implemented. The Delivery Dashboard was created as a web-enabled application using Visual Studio, ASP.NET, C# Language

## 2. DETAILS OF THE ORGANIZATION

Microsoft Corporation is an American multinational corporation headquartered in Redmond, Washington, that develops, manufactures, licenses, supports and sells computer software, consumer electronics and personal computers and services. Its best known software products are the Microsoft Windows line of operating systems, Microsoft Office suite, and Internet Explorer web browser. Its flagship hardware products are Xbox game console and the Microsoft Surface series of tablets. It is the world's largest software maker measured by revenues. It is also one of the world's most valuable companies.

Microsoft was founded by Bill Gates and Paul Allen on April 4, 1975 to develop and sell BASIC interpreters for Altair 8800. It rose to dominate the personal computer operating system market with MS-DOS in the mid-1980s, followed by Microsoft Windows. The company's 1986 initial public offering, and subsequent rise in its share price, created three billionaires and an estimated 12,000 millionaires from Microsoft employees. Since the 1990s, it has increasingly diversified from the operating system market and has made a number of corporate acquisitions. In May 2011, Microsoft acquired Skype Technologies for \$8.5 billion in its largest acquisition to date.

As of 2013, Microsoft is market dominant in both the IBM PC-compatible operating system and office software suite markets (the latter with Microsoft Office). The company also produces a wide range of other software for desktops and servers, and is active in areas including Internet search (with Bing), the video game industry (with the Xbox, Xbox 360 and Xbox One consoles), the digital services market (through MSN), and mobile phones (via the Windows Phone OS). In June 2012, Microsoft entered the personal computer production market for the first time, with the launch of the Microsoft Surface, a line of tablet computers.

With the acquisition of Nokia's devices and services division to form Microsoft Mobile OS, the company will re-enter the smartphone hardware market, after its previous attempt, Microsoft Kin, which resulted from their acquisition of Danger Inc.

## **2.1. Microsoft India**

Microsoft India Private Limited headquartered in Hyderabad, India is a subsidiary of US software giant Microsoft Corporation. The company first entered the Indian market in 1990 and has since worked closely with the Indian government, the IT industry, academia and the local developer community to usher in some of the early successes in the IT market. Microsoft currently has offices in the 13 cities of Ahmedabad, Bangalore, Chandigarh, Chennai, Coimbatore, Hyderabad, Indore, Jaipur, Kochi, Kolkata, Mumbai, New Delhi, and Pune. Increasingly, the company has become a key IT partner of the Indian government and industry, supporting and fueling the growth of the local IT industry through its partner enablement programs. Since its entry into India, Microsoft has focused on three key objectives:

- To become a key IT partner of the Indian government and the local IT industry
- To support and fuel growth of the local IT industry through its partner enablement programs
- To use the Microsoft Unlimited Potential program to enhance education, jobs and opportunities and foster innovation through relevant, affordable access to computing.
- Microsoft in India employs about 5,000 people and has six business units representing the complete Microsoft product portfolio.

## **2.2. Microsoft Business Units in India**

Microsoft runs the following six major business units representing our entire product cycle to serve customers from consumers to corporations, gamers to governments. Individual but connected, our businesses are responsible for their growth while also contributing to each other's success.

- Microsoft India Sales Marketing and Services Group (SMSG)
- Microsoft Research India (MSR)
- Microsoft Global Services India (MGSI)
- Microsoft India Development Center (MSIDC)

- Microsoft IT India (MSIT) and
- Microsoft Global Technology Support Center (GTSC)

### **2.3. Vision Statement**

Global diversity and inclusion is an integral and inherent part of our culture, fueling our business growth while allowing us to attract, develop, and retain this best talent, to be more innovative in the products and services we develop, in the way we solve problems, and in the way we serve the needs of an increasingly global and diverse customer and partner base.

### **2.4. Mission Statement**

The Microsoft mission regarding global diversity and inclusion is to create an environment that helps Microsoft capitalize on the diversity of its people and the inclusion of ideas and solutions to meet the needs of its increasingly global and diverse customer base.

### **2.5. Microsoft Products**

Microsoft is the worldwide leader in software, services and solutions that help people and businesses realize their full potential. Microsoft offers various software and hardware products. The leading products of Microsoft are Microsoft Windows, Microsoft Office Suite, Microsoft Windows Operating system, Microsoft Servers, Windows Developer Tools, Microsoft Expression, Business Software, Games and Xbox 360, Windows Live, Windows Phones and Apps, Microsoft SharePoint, Microsoft Azure, Office 365, Microsoft SQL, Microsoft Visual Studio, Bing Search, Skype, Nokia Devices and more.

### **2.6. Work Culture & Company Values**

The Work culture at Microsoft is fast paced, challenging, and a whole lot of fun. Whether at your workstation, in a virtual meeting with another part of the world, or taking a coffee break with friends, you will always find yourself collaborating, sharing new ideas and working on high impact products and technologies that impact billions of people around the world. Working on



products that have worldwide impact, you would be encouraged to take on big Challenges all the time. Whether you are working on the next version of Windows, developer tools, Office or the next generation mobile platform, it is hard to underestimate the work accomplished here.

At Microsoft, the following values have been observed and followed by the employees:

- Integrity and Honesty
- Passion
- Accountabilities
- Big Challenges
- Open & Respectful
- Self-critical

### **3. INFORMATION ACQUIRED DURING THE STUDY PERIOD – PROJECT DETAILS**

In this section of the report, the project objectives, methodologies followed, and the various phases of the project such as the project planning, requirements gathering and analysis, project development, implementation and testing is discussed in detail.

#### **3.1. Project Objective**

The main objective of the internship project was to create/implement the MCS India delivery dashboards for customer centric delivery tracking and management. A Balanced Scorecard Approach was used to implement the requirements of the organization. The Scorecard aimed at Monitoring the Delivery Health by using a consolidated view of the Key Performance Indicators (KPIs). The Dashboard showcases the required metrics analyzed from large volumes of data with appropriate Visualization and appropriate Drill down Flows.

The Major Benefits of the Dashboard to the organization was as follows:

- Bird Eye View of the Delivery Process
- Time Saving for stakeholders
- Assistance in Decision Making Process
- Timely insight to the areas that require attention of the stakeholders
- Consolidated Month-to-Date/ Year-To-Date View of KPIs

#### **3.2. Project Methodology**

This section explains the methodology followed in executing the project to observe the desired results. The Methodology followed to create the MCS India Delivery Dashboard consists of eight steps. The steps were decided based on the requirement for the project development. Figure 1 depicts the project methodology implemented graphically.



Figure 1. Project Methodology

### 3.2.1. Interaction with the Stakeholders

The first step of the Project involved the Interaction with the Stakeholders to understand the individual requirement of each stakeholder and the issues faced in the existing reporting system. During the interaction, various aspects of the project was discussed such as the delivery process and life cycle, involvement in the delivery process, roles and responsibility, organizational structure and the various Key Performance Indicators that play a part in the decision making process.

### **3.2.2. Step 2: Study and Consolidation of KPIs into a Balanced Scorecard**

After obtaining a list of the KPIs required, a study of the KPIs and their consolidation into different categories for better data visualization was done. A comparison of the functionalities and grouping analysis was performed. The result of this step was the division of KPIs into different categories. A list of KPIs per stakeholder view was also obtained after this step.

### **3.2.3. Data Mapping Exercise**

The Mapping of the Data Sources for the various KPIs is an essential part of the implementation of the project. In this step, the metrics of the Key Performance Indicators (KPIs) and their sources were mapped, with the help of the India and Singapore Operations Team. Along with the Data Mapping, this step also aimed at gaining an understanding of the data retrieval, storage and updating process. Requirements gathering and sample data collection, scoping, and the identification of functional and non-functional requirements were also performed in this step of the process.

### **3.2.4. Analyzing and Visualization of Metrics from Data**

The process of analysis and visual monitoring involves a series of sequential steps that the dashboard should be designed to support. To Begin with, an analysis of the KPIs and their metrics to be depicted on the dashboard was performed. The mathematical calculation of the metrics was also identified. Once the metrics were determined, the design and visualization of the KPIs and their associated metrics was looked upon. A Balanced Scorecard representation was used in the design.

### **3.2.5. Strategic User Flow Design**

The User Flow model for the access of the MCS India Delivery Dashboard was determined in this step. A top-down approach was implemented for the User flow. The User Flow Diagram is as shown in Figure 2.

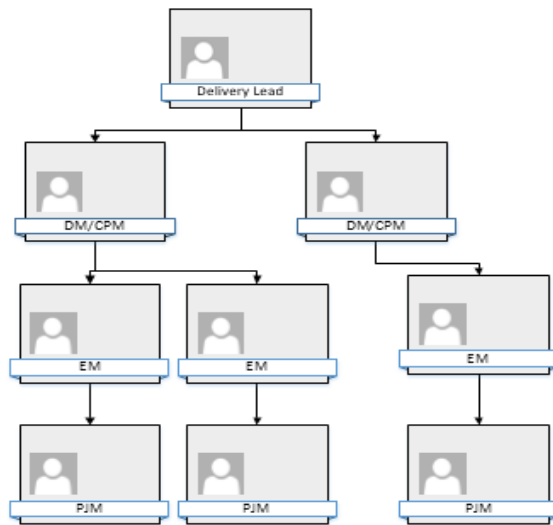


Figure 2. User Access and Flow Design

### 3.2.6. Strategic Data Flow Design

A Bottoms-Up approach was implemented for the Data flow. The roll up of the data from the source to the metrics representation on the dashboard was determined in this step. The Data Flow for the 19 Identified KPIs was designed. The Data Flow Diagram is as shown in Figure 3.

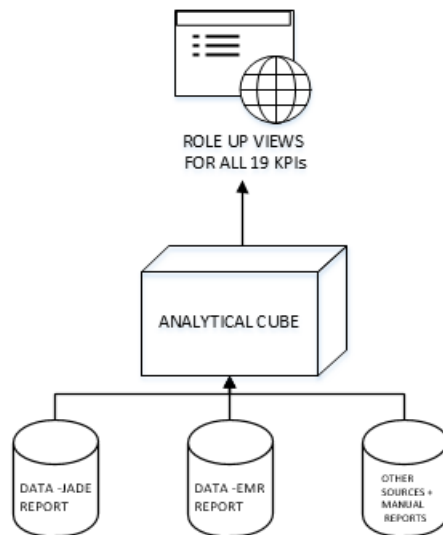


Figure 3. Data Flow Diagram

### 3.2.7. Business Requirement Document

The purpose of the Business Requirements Document (BRD) is to articulate the detailed to-be process vision and translate that vision into specific requirements for the solution. The Business Requirement Document was formulated for all the stakeholders' views.

### 3.2.8. Implementation Phase1 of the MCS India Delivery Dashboard

In this Step the front-end and the initial phases of the backend of the MCS India Delivery Dashboard for the sample data obtained was created. The Dashboard was implemented in ASP.NET and C# using Visual Studio. The Database was designed using SQL. The Implementation Phase1 implemented the Dashboard for different views of the stakeholders.

### 3.3. Project Planning

The Project Plan was created using Microsoft Project 2013 application software. Microsoft Project 2013 is a project management software program, developed and sold by Microsoft, which is designed to assist a project manager in developing a plan, assigning resources to tasks, tracking progress, managing the budget, and analyzing workloads. Figure 4 depicts the implementation plan for the MCS India Delivery.

	📌	Task Mode	Task Name	Duration	Start	Finish	Predecessors
1	✓	Manual	UX	5 days	Mon 6/23/14	Fri 6/27/14	
2	✓	Auto	UI Design	32 hrs	Mon 6/23/14	Thu 6/26/14	
3		Auto	Web Application	10 days	Mon 6/30/14	Fri 7/11/14	
4	✓	Auto	Development of Model	16 hrs	Mon 6/30/14	Tue 7/1/14	2
5	✓	Auto	Development of Stored Procedure	24 hrs	Wed 7/2/14	Fri 7/4/14	4
6	✓	Auto	Development of Wiring Code	24 hrs	Sun 7/6/14	Wed 7/9/14	5
7		Auto	UI Integration	24 hrs	Wed 7/9/14	Fri 7/11/14	6
8	✓	Auto	Data Layer	3 days	Wed 7/16/14	Fri 7/18/14	
9	✓	Auto	Table Design	24 hrs	Wed 7/16/14	Fri 7/18/14	2
10		Auto	Stabilize	2 days	Mon 7/21/14	Tue 7/22/14	
11	📅	Auto	Testing	16 hrs	Mon 7/21/14	Tue 7/22/14	
12	📅	Auto	New Changes	24 hrs	Mon 7/28/14	Wed 7/30/14	

Figure 4. Gantt Chart of the Implementation Plan

### 3.4. Project Requirement Gathering and Analysis

The Requirements and the sample data was gathered from their data sources by using the results of the Data Mapping Exercise. Scoping was performed on the gathered data. The data was then analyzed using Microsoft Excel. The BI tools offered in Microsoft Excel was made use of for the analysis. The required mathematical calculations and metrics extraction was performed on the data. The Functional and Non-Functional Requirements of the Dashboard was identified after Analysis of the data.

The MCS India Delivery Dashboard represents / displays multiple KPI (Key Performance Indicators) and the KPI's are grouped under different categories. The following section provides the list of the categories and their respective KPI's. The KPI and their category mapping differs based on the user logged in to the dashboard.

#### 3.4.1. Roles/Views

The MCS India Delivery Dashboard has been designed for the following stake holders. Each stake holder directly maps to an organizational level at which MCS is managed.

<b>Role</b>	<b>Description</b>
Delivery Lead	Delivery lead leads the MCS organization and multiple delivery managers reports to the Delivery Lead
Delivery Manager	Delivery manager oversees set of Engagement managers and multiple engagement managers reports to Delivery Manager
Engagement Manager	Engagement manager manage multiple accounts. Under each accounts there are multiple projects / engagements.
Project Manager	Project manager manage multiple projects / engagements.

### 3.4.2 KPI Categories

The Dashboard contains the following KPI categories and they're as follows:

- Finance
- Customer
- Delivery Partners
- Delivery/Engagement/Project Health
- People/Myself

Multiple KPI's are grouped under the above categories in Tiled format and their respective is displayed to the logged in user. The KPI value will differ based on the logged in user and their profile. Also, the KPI grouping will also differ based on the user logging in and their profile.

#### 3.4.2.1. Finance

The Finance category contains the KPI'S (Backlog, Billed Revenue, New Work Sold, Delivery Margin, Risk Reserve and EAC Variance from Budget). The KPI's are displayed based on the roles, the following matrix provides the mapping between the KPI's and the roles & their access.

<b>Roles</b>	<b>Backlog</b>	<b>Billed Revenue</b>	<b>NWS</b>	<b>Delivery Margin</b>	<b>Risk Reserve</b>	<b>EAC Variance from Budget</b>
Delivery Lead	✓	✓	✓	✓	✗	✗
Delivery Manager	✓	✓	✓	✓	✗	✗
Engagement Manager	✓	✓	✗	✓	✓	✗
Project Manager	✗	✗	✗	✓	✓	✓

Note: ✗ - Indicates that the role doesn't have access to the KPI and it would not be visible on the screen

✓ - Indicates that the role have access to the KPI and it would be visible on the screen



### 3.4.2.2. Customer

The customer category contains the KPI'S (CPE, Forecasted Surveys, Change Management, and EAC Variance from Schedule). The KPI's are displayed based on the roles, the following matrix provides the mapping between the KPI's and the roles & their access. For more information on Roles refer to role section in the document

<b>Roles</b>	<b>CPE</b>	<b>Forecasted Surveys</b>	<b>Change Management</b>	<b>EAC Variance from Schedule</b>
Delivery Lead	✓	✓	✗	✗
Delivery Manager	✓	✓	✗	✗
Engagement Manager	✓	✓	✓	✗
Project Manager	✓	✓	✓	✓

### 3.4.2.3. Delivery Partner

The Delivery Partners category contains the KPI'S (Circle of Excellence and Global Delivery). The KPI's are displayed based on the roles, the following matrix provides the mapping between the KPI's and the roles & their access. For more information on Roles refer to role section in the document

<b>Roles</b>	<b>COE</b>	<b>GD</b>
Delivery Lead	✓	✓
Delivery Manager	✓	✓
Engagement Manager	✗	✗
Project Manager	✗	✗

### 3.4.2.4. Delivery/Engagement/Project Health

This category contains the KPI'S (Planned Vs Actual Hours, IP Utilization, POEC and Issue tracking). The term "Delivery Health" is used to describe this category for the Delivery Lead and Delivery Manager. While the term "Engagement Health" and "Project Health" is used for the Engagement Manager and Project Manager respectively. The KPI's are displayed based on the roles, the following matrix provides the mapping between the KPI's and the roles & their access. For more information on Roles refer to role section in the document.

<b>Roles</b>	<b>Planned Vs Actual Hours</b>	<b>IP utilization</b>	<b>POEC</b>	<b>Issue Tracking</b>
Delivery Lead	✓	✓	✓	✓
Delivery Manager	✓	✓	✓	✓
Engagement Manager	✓	✓	✓	✓
Project Manager	✓	✓	✓	✓

### 3.4.2.5. People/Myself

This category contains the KPI'S (Role Readiness Index, Head Count, and Overall Utilization). The term "People" is used to describe this category when the logged in user is either the Delivery Lead or the Delivery Manager, whereas when the logged in user is the Engagement Manager or Project Manager the term used is "Myself". The KPI's are displayed based on the roles, the following matrix provides the mapping between the KPI's and the roles & their access. For more information on Roles refer to role section in the document

<b>Roles</b>	<b>Role Readiness Index</b>	<b>Head Count</b>	<b>Overall Utilization</b>
Delivery Lead	✓	✓	✓
Delivery Manager	✓	✓	✓
Engagement Manager	✓	✗	✓
Project Manager	✓	✗	✓

### 3.5. Project Implementation Phase 1

The Project was implemented using Microsoft ASP.NET and C# Language on Visual Studio. The IIS Web Server was made use of and for the database, Microsoft SQL Server was used.

#### 3.5.1. Microsoft ASP.NET

ASP.NET is a unified Web development model that includes the services necessary to build enterprise-class Web applications with a minimum of coding. ASP.NET is part of the .NET Framework, and when coding ASP.NET applications we have access to classes in the .NET Framework. We can code the applications in any language compatible with the common language runtime (CLR), including Microsoft Visual Basic and C#. These languages enable us to develop ASP.NET applications that benefit from the common language runtime, type safety, inheritance, and so on. The Implementation of the MCS India Delivery Dashboard was done using the C# Language. ASP.NET MVC helps Web developers build standards-based Web applications that are easy to maintain because it decreases the dependency among application layers by using the Model-View-Controller (MVC) pattern. It also provides complete control over the page markup. ASP.NET MVC improves testability by supporting Test Driven Development (TDD). The .NET Framework itself can be divided into three parts:

- **The CLR:** A managed execution environment that handles memory allocation, error trapping, and interacting with the operating-system services.

- **The Base Class Library** An extensive collection of programming components and application program interfaces (APIs).
- **Two top-level development targets** One for Web applications (ASP.NET) and another for regular Windows applications (Windows Forms).

The advantages offered by the .NET Framework include shorter development cycles (code reuse, fewer programming surprises, support for multiple programming languages), easier deployment, fewer data type–related bugs due to integral type safety, reduced memory leaks thanks to the garbage collector, and, in general more scalable, reliable applications.

### 3.5.2 C# Language

C# is modern, high-level, multi-paradigm, general-purpose programming language for web development and building apps using Visual Studio and the .NET Framework. C# is designed to be simple, powerful, type-safe, and object-oriented. The many innovations in C# enable rapid application development while retaining the expressiveness and elegance of C-style languages. C# is an object-oriented language. It supports the notion of classes and the object-oriented nature of classes including encapsulation, inheritance, and polymorphism. C# also supports interfaces in conjunction with the .NET Common Language Runtime (CLR) garbage collection, which some feel is necessary in an object-oriented language. It also supports the notion of indexers, which in simplified terms lets you manipulate objects as arrays and delegates, which you can think of as method callbacks on steroids. The .NET Framework supports console applications, graphical user interface (GUI) applications (Windows Forms), browser-based applications (Web Forms and ASP.NET), and Web Services. C# Language is extensively used for the development of Web Enabled Application and hence has been used in this project as well.

Below is a snapshot of the implemented MCS India Delivery Dashboard for the different Views: Delivery Lead View, Delivery Manager, Engagement Manager and Project Manager. **Please Note that the source code samples have not been added in the report due to confidentiality agreement with Microsoft.**

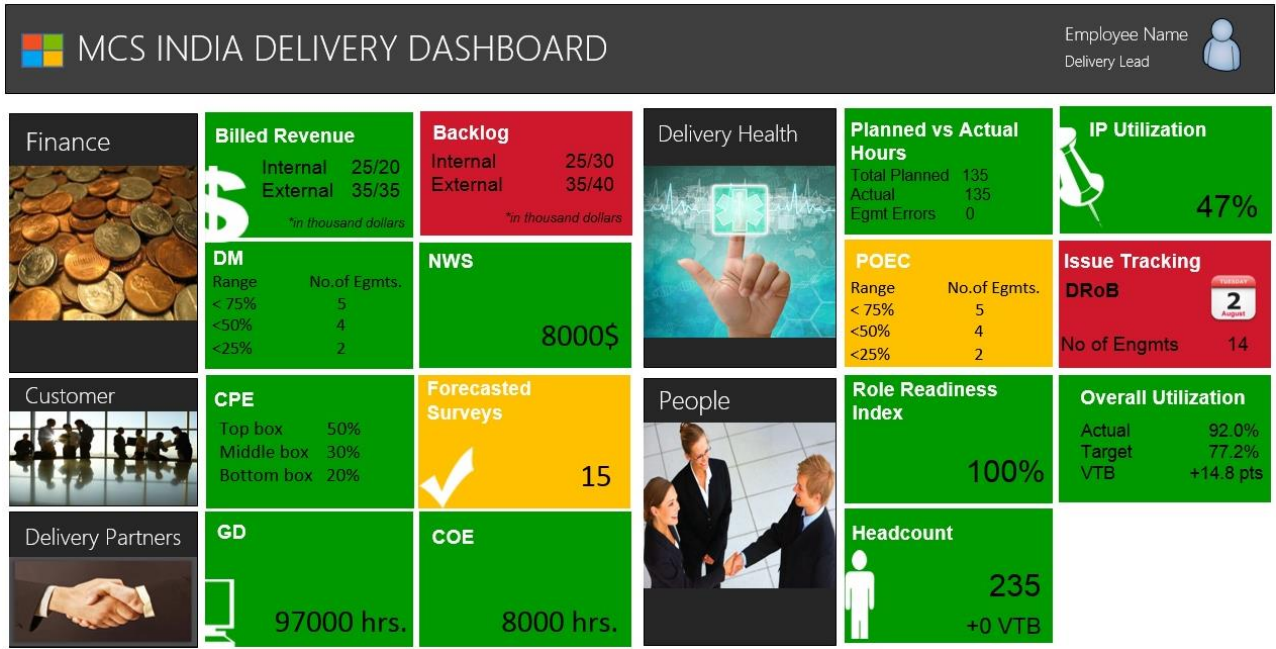


Figure 5. Delivery Lead View



Figure 6. Delivery Manager View



Figure 6. Engagement Manager View

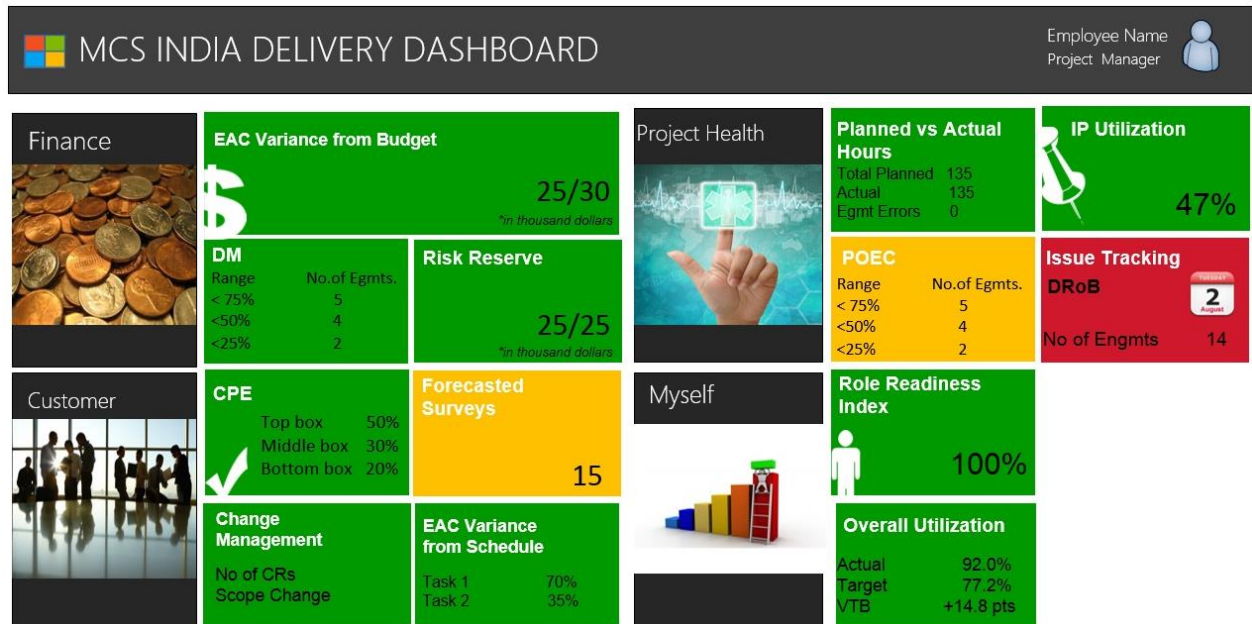


Figure 7. Project Manager

### **3.6. Project Testing and accommodation of new changes**

After the Implementation of the MCS India Delivery Dashboard, the functionalities were tested for their performance and results. The Changes suggested by the stakeholders were noted down and implemented in this stage. A requirement for addition of two new KPIs Lead to the re-arrangement and grouping of them. These changes were then reflected in both front-end and backend. The source code was updated and the design changes were made in this step of the project.

## **4. CONCLUSION**

Many companies have adopted the balanced scorecard approach to dashboard design for better performance measurement systems. Adopting these concepts provides clarification, consensus, and focus on desired improvement in performance. Companies are using Dashboards to clarify and update their strategy, communicate strategy through their organizational structure, align units and individual goals with the company strategy, link strategic objectives to long term targets and annual budgets and to conduct periodic performance reviews. The balanced scorecard approach is well suited for organizations that require timely and consolidated access to data for qualitative and actionable decision making. The dashboard puts strategy and vision, not control, at the center. It helps establishing goals for the teams and assumes that the team makes use of it to achieve the targets by adopting necessary actions and changes required. It is designed in a manner to pull people to the overall vision of the organization. Senior Manager may know what the results should be, but in some situations may have a problem in communicating it to the junior team members. The Dashboard provides a means of performance measurement and a customer centric tracking system that helps communicating the information much easily across the teams.

This new approach to performance measurement is consistent, with initiatives underway in many companies: cross-functional integration, customer-supplier partnerships, global scale, continuous improvement, and team rather than individual accountability .By combining the

Financial, Customers, Delivery Partners, Delivery Health and People Information, the balanced scorecard helps the stakeholders to analyze and understand, at least implicitly many relationships. This understanding can help them transcend traditional notions about functional barriers and ultimately lead to improved decision Making and problem solving. The dashboards and balanced scorecards keep companies looking-and-moving forward instead of backward.

## 5. References

The Following resources were used for the reference of the project.

- Microsoft Developer Network Library (<http://msdn.microsoft.com/en-us/library/>)
- Information Dashboard Design Book by Stephen Few
- The Harvard Business Review – “The Balanced Scorecard” by Robert S Kaplan and David Norton.

## 6. Acknowledgement

During the course of my industrial internship I got an exposure to the corporate work culture. I received an opportunity to adapt to the office environment and learn about real time project management and development. Working on a live project helped me gain knowledge and experience on how projects are executed in the corporate world. As a part of my project work, I got an opportunity to work with the MCS India lead, senior MCS folks, Finance, and Operations (India and Asia/Singapore Units). This experience has helped me shape myself in accordance with the current industrial developments and trend. I was given freedom to analyze, develop and implement my ideas in the project, and this has helped in stimulating my thought process. The internship was a good learning curve of the professional environment and overall it was a very insightful and wonderful learning experience. I would like to take this opportunity to thank the Institute and Department of Computer Science in giving me this opportunity to do an internship during my Summer Vacations. I would also like to extend my gratitude to Microsoft Corporation India Pvt. Ltd, my mentors, my manager, and all Microsoft folks who helped me in successfully completing this project.