

# Design and Development of Employee Utilization Dashboard

GUNDUGULA NAGA CHANDRA LIKHITA, ADITI BHARDWAJ, NETHRAVATHI K.A., DR. ABHILASH KRISHNA D G,  
DR. RAMAVENKATESHWARAN, ASHISHKUMAR MANGALDAS

STUDENT, STUDENT, ASSISTANT PROFESSOR, ASSISTANT PROFESSOR, ASSISTANT PROFESSOR, SENIOR ARCHITECT  
ECE DEPARTMENT, EEE DEPARTMENT, ECE DEPARTMENT, EEE DEPARTMENT, ECE DEPARTMENT, GRS-ET  
RV COLLEGE OF ENGINEERING, BANGALORE, INDIA

**Abstract:** Dashboards are essential to business performance management since they offer vital reporting and measurement data. dashboards show important data and performance indicators in real-time to help you make decisions and better navigate the business environment. Employee utilisation is driven by business metrics for a particular role or department. It provides us with information with regards to the overall profitability and productivity of the entire business or a particular business unit. This work proposes to design and develop a dashboard which showcases the activities, employee details and other information regarding the organization in an organised manner. Also to analyse data over periods of time in the recent past and long term through web development. Businesses can track, analyse, and display data with the aid of a data dashboard, which is typically used to obtain a greater understanding of an organization or department or even a particular process. In this project the dashboard is modelled and evaluated by using HTML, CSS and JavaScript. Dashboards are a data visualisation tool that allow all users to understand the analytics that matter to their business, department or project. It gives an opportunity for non-technical users as well to understand the analytics process by data modelling and visualisation techniques.

**Index Terms:** Dashboard, Employee Utilization, AngularJs, Agile Methodology, HTML.

## I. INTRODUCTION

Dashboards let professionals quickly understand the most crucial elements of their data. They receive competitive assessments and real-time insights, which they utilize to identify issues that need immediate attention while streamlining workflows and effectively allocating resources. When managing, developing, and sharing reports, which maybe a time-consuming task needing a lot of upkeep and adjustment to satisfy various and perhaps competing - criteria, IP dashboards are extremely useful. A live, visual summary of the success of your sales team is displayed on a real-time dashboard. Everyone can see how close the team is to reaching their targets for the day, week, or month thanks to this dashboard, which is instantly updated with fresh data anytime a team member closes a sale. Employees may instantly check in on the team's success or join in the fun when a fellow agent meets a sales target thanks to team dashboards that can be displayed on TVs in the office. Employees can check on their personal progress or learn how other team members have been performing lately using dashboards that can be viewed on mobile devices as well.

Business metrics specific to a role or department determine how effectively employees are utilized. The effect it has on the company's general productivity and profitability is important to know. Understanding employee utilisation rate, its significance, and how a business may encourage and support its workers at work to maximize employee productivity will be made easier as a result of this. It offers information on the products and services the company offers, as well as contact information for its staff and other company-related details. Utilization Dashboard enables Premium account holders to track both billable and non-billable time to determine how productive their team is. Utilizing this dashboard is an excellent approach to study data over long and short time horizons. Dashboards are used by IP professionals to swiftly understand the most crucial elements of their data. They receive competitive assessments and real-time insights, which they utilize to identify issues that need immediate attention while streamlining workflows and effectively allocating resources. For better decision-making, dashboards are essential. They might be dynamic and interactive, allowing you to apply filters to access the information that best satisfies your needs. Dashboard aggregate information from several sources and systems and combine it into a single interface to provide a thorough overview of the business.

A detailed research was done and some observations have been explained below.

In [1] paper the proposed system is a statistics dashboard that keeps track of every action from client request through order delivery while also taking client data safety into account by putting in place various security measures. The system is composed of six components, including one with a login module as well as five dashboards.

In [2] paper they provided a thorough task analysis based on one-on-one sessions with front line analysts, a co-design workshop, and interviews with healthcare professionals. They developed a metric card metaphor as a unit of visual analysis in healthcare quality improvement from these activities, using this idea as a foundation for creating highly customizable dashboards, which led to the creation of a metric specification structure (MSS).

In [4] paper they suggested a method for utilizing computer vision-based algorithms to identify accidents from dashboard camera footage. To create a computationally less expensive accident detection model for practical usage, the fluctuation in visual information during accidents is examined. In [5] paper they demonstrated an experimental dashboard for managing and monitoring microservices. The dashboard supports the integration of several monitoring infrastructures for gathering information on the runtime of microservices and can be customised to meet the needs of various stakeholders.

In [6] paper the analysis of how the European Union's finances are used in the autonomous region of Madeira served as the foundation for the information they have provided here (RAM). The project was created, the data was transformed, and the dashboard was constructed using Microsoft Power BI. This

[11] paper explains the work produced and the knowledge gained from the establishment of a dashboard in a research and innovation system organization, CTCV. The suggested solution is therefore investigated as a management and decision support system at the operational and strategic level, enabling CTCV decision makers to access pertinent information in real time and in a dynamic and interactive way.

After going through many papers, noticed some of the key points which motivated to carry out this project further and the summary of the papers are as follows:

- Dashboards are built by considering the safety and security to the data provided by using various security mechanisms.
- They proposed a novel approach to modify the OpenStack Dashboard's structure to adapt to an organization's hierarchy and in addition they also integrated modules like user and tenant registration, role based access control and custom flavor creation onto the Open Stack dashboard to make it more flexible and easy to use.
- The Dashboard prepared helps the organization in making faster, accurate, with ease and proficiency to analyze the data provided with lowest level of granularity.

The objectives this paper addresses are mentioned below:

- To design and develop a dashboard which showcases the activities, employee details and other information regarding the organization.
- To analyze data over periods of time in the recent past and long-term through web development.
- To model and evaluate the dashboard by using HTML, CSS, JavaScript and various other emerging technologies.

## II. METHODOLOGY

A grid-structured layout component called Angular Dashboard Layout or Dashboard Template aids in the creation of both static and dynamic dashboard layouts with panels. The fundamental components of a dashboard are its dashboard panels, which can be dynamically or programmatically created during runtime. The adoption of a dashboard is a continual improvement process, requiring periodic adjustments to adapt to the conditions of each new moment and align the indications with the organization's goals. The design, usability, and analysis of dashboards must also be evaluated to determine whether they are in line with the business strategy and the demands of their users for an accurate diagnosis of the results and subsequent decision-making. A graphical interface that often provides fast views of performance indicators (KPIs) relevant to a certain objective or business activity is an example of a dashboard.

### A. Agile Methodology

A system might be confusing at times since there are many moving parts in it. In order to manage a project, the Agile methodology separates it into several phases. Continuous cooperation with stakeholders and development at every stage are necessary. Once the job is underway, groups cycle through a middle of preparing, performing, and evaluating. Collaboration, a consistent focus on business value, and a suitable degree of quality are the three important factors that will enable the project to be successful if it is determined that agile is the best development style to adopt. Agile dashboards give you a top-down perspective of everything that is going on with a project, including where the moving components are, what is being done, what needs to be done, what has been completed, and even certain agile KPIs.

### B. Dashboard Methodology

The technique of the procedure is the key to developing an efficient advanced dashboard. One can create a dashboard that will guide your company toward success if they approach the process methodically and follow each of the stages shown in Figure. 1 below.

- Gathering requirements:

In terms of dashboard design, that implies getting input from the target user (s). Any or all of the following may constitute important data to be gathered:

The target audience includes CEOs, executives, managers, analysts, and consultants, what platform will the dashboard be used on? Important Performance Metrics, filters that will be used, various subcategories (Pages/tabs), data sources for dashboards, deadlines for the dashboard's preliminary and final iterations.

- Wire framing and ideation:

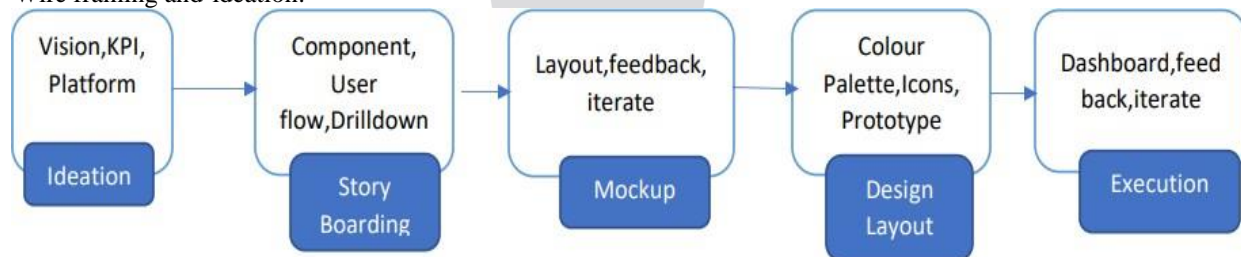


Fig. 1. Dashboard Methodology

It's crucial to ensure that everyone on the team is focused on the same goal and reading from the same page is essential. Additionally, it is also crucial for developing a documented path to the goal using tools like wireframes. The following inquiries should be addressed throughout this stage of the design process:

What crucial actions are crucial? What elements are required to represent the specific data (charts, tables, KPI tiles, geo)? What filters should be used?

- Storyboarding

The storyboarding stage should offer solutions to certain design queries like:

When a user selects a link on the dashboard, what happens? If there is a drilldown feature, what levels will it offer? When the user selects a filter, which components will be filtered? Which tasks are performed by the icons?

- Design layouts and mockups:

At this stage, tools including smartboards, Presentation, MS Paint, Balsamiq, Image Editing, Illustrator, and just a pencil and piece of paper are routinely used. More important than the tool selected to generate the mockup is the team's level of tool proficiency and familiarity. The layout of your dashboard will be shaped by any or all of the following inputs:

The arrangement of the elements  
The location of the filters  
Panel positioning and grid arrangements  
Colors used on the dashboard.

- SAP Modifications:

For dashboard development will need a few extra tasks, like: numerous aspects, such as the grid system, responsive design, panels, components, typography, title, headline, filters, icons, and logos, are added to the dashboard to deal with the dashboard's layout design, create a CSS file. components are connected to data sources; Performance can be changed as necessary.

### C. Flowchart

Figure. 2 displays the various stages in the implementation of the Utilisation Dashboard. The initial stage of the project includes Collection and Analysis of the data; the Human resource team uses the Simple Time Tracking (STT) system for collection of vital information with regards to all the employees in the company, rubrics for data collection include Employee Id, skill set, project details, number of hours dedicated to specific project etc. This data set is provided to the developers in the form of an excel sheet. Following this the data is analyzed, dominant parameters are recognized and other factors holding marginal importance are neglected. Second phase of the project involves the Designing and Development of the Dashboard, a set of requirements have been decided based on discussions with the stakeholders, a user flow diagram or high-level UML diagram is drawn to show the work of the features.

The development starts once the team decides what is needed. Project designers and developers begin work on their project, with the goal of deploying a functional product. Further o

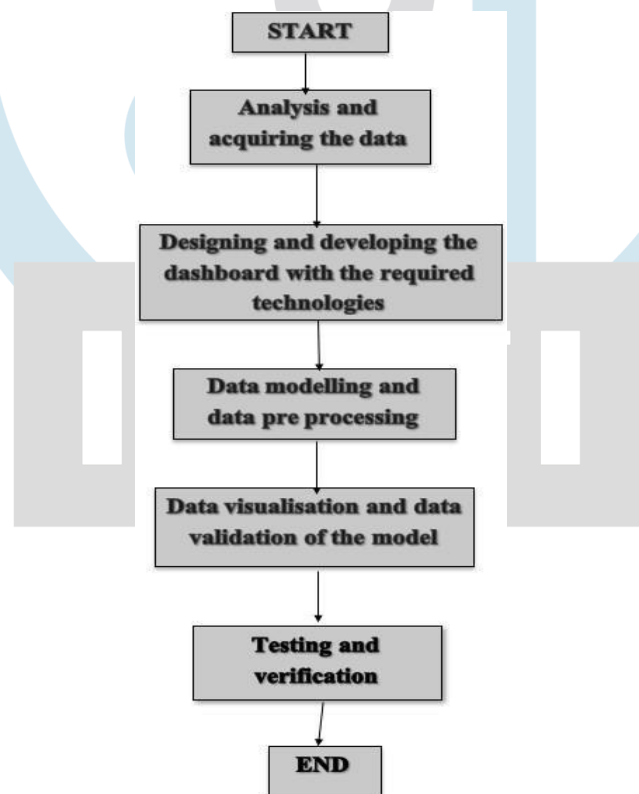


Fig. 2. Flowchart a Dashboard

n, the data is pre-processed and structured in accordance with the developers requirement for ease of use during the development stage. The factors of less to no importance are neglected and discarded from the excel sheet. The data set is inspected so as to check for any missing or data which may be in the incorrect format. After importing the data on to the web application, data visualisation and validation techniques are worked on. Data visualisation is the process of displaying data using common images like infographics, charts, and even animations. These instructional visual representations make it easy to understand complex data connections and data-driven conclusions.

### D. Steps involved

Tables, charts, gauges, and figures are the building blocks of dashboards. They can be applied to practically every situation and in any sector. A project dashboard, financial dashboard, marketing dashboard, and more might all be created, for instance. The steps

involved for the implementation of the dashboard include the Cloud computing which is performed using Azure software, the repositories are obtained from the GitHub, for CICD Pipeline Jenkins is used, UI (Frontend) is conducted using AngularJs, the Backend is conducted using .Net core, the database is acquired from Azure SQL and Azure Virtual Machine, Docker Hub is used as a repository for Image Registration.

### III. RESULTS AND DISCUSSION

The results which we have acquired after the implementation of the AngularJs dashboard are discussed here. The snapshots of the results have been attached and are discussed in this chapter. The performance is measured basically by the analysis of the utilization factor of each of the employee.

#### A. Experimental results

The results are continuous. The data is taken from the company employee database and is converted into an excel sheet. It is then compiled and converted into a JSON file and it has been used for acquiring the required graphs depicting the utilization factor and various other parameters.

Figure. 3 shows the relation between employee performance and the number of projects. It indicates that as the number of projects are



increasing the employee performance is increasing which indicates that the recorded employee utilization can be differentiated as billable or non-billable depending on the performance factor. Organizations use employee performance evaluations, commonly referred to as “performance reviews,” to provide employees with feedback on their job performance and formally record that performance. Although each company sets its own evaluation cycles, the majority of them carry out annual employee performance reviews. We can use measures to manage the project as we carry it out. A well-managed project is more likely to have a substantial impact and return on investment. Here are the two metrics for project performance that are most frequently used: on-time and on-budget. And throughout the project, these are evaluated at frequent checkpoints.

#### B. Employee Role Division

Task distribution among staff is a crucial part of managing your company. All relevant tasks are done since each employee has a clear job description and set of responsibilities. Giving staff distinct tasks to complete also enables them to specialize and complete their work quickly. The first step in assigning tasks is to assess your current personnel and their roles. It is more efficient to spend time and resources by getting rid of redundant tasks that each employee undertakes. The obligations, demands, and responsibilities of task performed by the employees in the organization are referred to as the “division of responsibilities.”

Fig. 4. Distribution of Employee Role

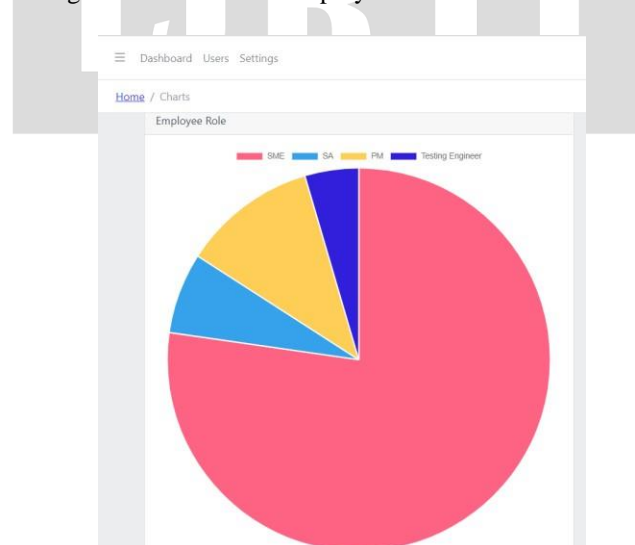


Figure. 4 shows the distribution or division of the employees into different divisions like SME, SA, PM, Testing Engineer. Employee role division makes it easier for the organization to keep a track of the employees being assigned to different roles in the company. It also helps in getting an overview of the projects that the respective departments are dealing with. Therefore, the bar graph shows the division of the role.

#### C. Project Division



Project division can be used to divide larger projects into several smaller ones. This feature makes it possible for several team members to work independently on various areas of a project at the same time. This feature makes it possible for several team members to work independently on various areas of a project at the same time.

Figure. 5 shows the division of the projects and the number of employees working in that particular project. This helps in keeping a track of the number of employees assigned to a particular project.

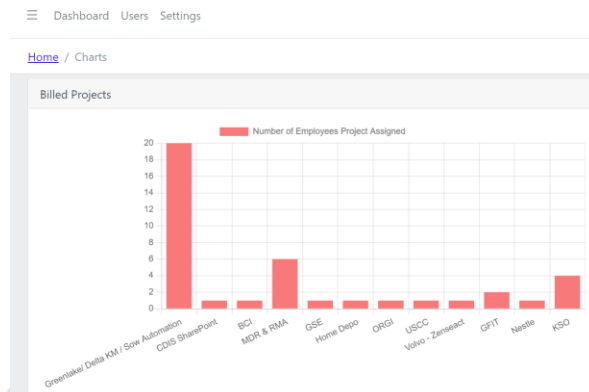


Fig. 5. Number of Employees Vs Billed Projects

D. Utilization Result

| Employee             | April | May  | June | July | August | September | October | Utilization  |
|----------------------|-------|------|------|------|--------|-----------|---------|--------------|
| Manohar, Chilankuri  | 100%  | 100% |      |      |        |           |         | Billable     |
| Minu Harimohan,      | 100%  | 90%  |      |      |        |           |         | Billable     |
| Santosh Kumar Sethy, | 100%  | 100% |      |      |        |           |         | Billable     |
| Avinash DN,          | 100%  | 80%  |      |      |        |           |         | Billable     |
| Prashant Bankapur,   | 70%   | 60%  |      |      |        |           |         | Non-billable |
| Kalin Goyal,         | 60%   | 60%  |      |      |        |           |         | Non-billable |
| Manoj Kumar          | 100%  | 100% |      |      |        |           |         | Billable     |
| Amrith Sundaram,     | 100%  | 70%  |      |      |        |           |         | Non-billable |
| Vinayak              | 100%  | 100% |      |      |        |           |         | Billable     |
| Prasoon N            | 100%  | 80%  |      |      |        |           |         | Billable     |
| Sruthi VN            | 100%  | 100% |      |      |        |           |         | Billable     |
| Aravind Umashankar   | 100%  | 50%  |      |      |        |           |         | Non-billable |

Fig. 6. Employee Utilization Table

Figure. 6 shows the utilization table of the employees. It shows the details of the employees whose utilization is billable and non-billable.

IV. CONCLUSION

In every business it is important to track the resources of the company to justify decisions made by the management and in a business an employee is the most valuable resource. Dashboards are the data visualisation tool that allow the stake-holders i.e, the management to understand the analytics that matter to their business, department or project. Dashboards are reporting tools for business intelligence (BI) that compile and show important metrics and key performance indicators (KPIs) on a single screen, allowing users to monitor and assess business performance quickly. An employee Utilisation Dashboard is created for the HPE Global Remote Services Department which includes information regarding all employees and other crucial information regarding their skill set, project details, billable and non-billable hours etc. Various infographics and charts are also created for easier understanding and faster decision making. This provides the stakeholders with a better understanding of how the resources are being utilized and which would be the optimal method of gaining higher productivity and therefore better performance and overall profits. As the industry transitions to a cloud infrastructure, dashboards are becoming more and more widespread.

V. ACKNOWLEDGMENT

I express my gratitude to my team mate in the project Aditi Bhardwaj and we are indebted to our guides, Dr. K. A. Nethravathi, Assistant Professor, Dr. Abhilash Krishna, Assistant Professor, RV College of Engineering® and Mr. Ashishkumar Mangaldas Chourasia, Software Architect, Hewlett Packard Enterprise for their wholehearted support, suggestions and invaluable advice throughout my project work and also helped in the preparation of this thesis. I express sincere gratitude to our beloved Principal, Dr. K. N. Subramanya for his appreciation towards this project work. I thank all the teaching staff and technical staff of Electrical and Electronics Engineering department, RVCE for their help. I take this opportunity to thank our family members and friends who provided all the backup support throughout the project work.

REFERENCES

[1] S. Mahajan, M. Parekh, H. Patel and S. Patil, *BRB dashboard: A web- based statistical dashboard* 2021 International Conference on Innovations in Information, Embedded and Communication Systems (ICI- IECS), 2021, pp. 1-6, doi: 10.1109/ICIIECS.2021.8276076.

- [2] M. Elshehaly et al., *QualDash: Adaptable Generation of Visualisation Dashboards for Healthcare Quality Improvement*, in IEEE Transactions on Visualization and Computer Graphics, vol. 27, no. 2, pp. 689-699, Feb. 2021, doi: 10.1109/TVCG.2020.3030424.
- [3] Q. Han, P. Nesi, G. Pantaleo and I. Paoli, *Smart City Dashboards: Design, Development, and Evaluation* 2021 IEEE International Conference on Human-Machine Systems (ICHMS), 2021, pp. 1-4, doi: 10.1109/ICHMS49158.2021.9209493.
- [4] E. P. Ijjina and S. K. Sharma, *Accident detection from dashboard camera video*, 2021 10th International Conference on Computing, Communication and Networking Technologies (ICCCNT), 2021, pp. 1- 4, doi: 10.1109/ICCCNT45670.2021.8944520.
- [5] B. Mayer and R. Weinreich, *A Dashboard for Microservice Monitoring and Management* 2021 IEEE International Conference on Software Architecture Workshops (ICSAW), 2021, pp. 66-69, doi: 10.1109/ICSAW.2021.44.
- [6] D. Pimenta, M. Teles, J. Bernardino and I. Pedrosa, *Monitoring the allocation of European funds in Madeira using dashboards* 2021 16th Iberian Conference on Information Systems and Technologies (CISTI), 2021, pp. 1-7, doi: 10.23919/CISTI52073.2021.9476283.
- [7] S. B. Akki and M. N. Vijayalakshmi, *Design of Dashboard for University Examination Result Analysis System* 2020 3<sup>rd</sup> International Conference on Computational Systems and Information Technology for Sustainable Solutions (CSITSS), 2020, pp. 313-316, doi: 10.1109/CSITSS.2020.8768498.
- [8] J. Bernard, D. Sessler, J. Kohlhammer and R. A. Ruddle *Using Dashboard Networks to Visualize Multiple Patient Histories: A Design Study on Post-Operative Prostate Cancer* in IEEE Transactions on Visualization and Computer Graphics, vol. 25, no. 3, pp. 1615-1628, 1 March 2020, doi: 10.1109/TVCG.2020.2803829.
- [9] A. Hume, N. Ferreira and L. Cernuzzi, *The design of a privacy dashboard for an academic environment based on participatory design* 2020 XLVIII Latin American Computing Conference (CLEI), 2020, pp. 1-10, doi: 10.1109/CLEI53233.2020.9640155.
- [10] P. P. Anchalia, P. Gupta and J. Shetty, *A Customized Dashboard for VM Provisioning Using OpenStack* 2020 7th International Conference on Computational Intelligence, Communication Systems and Networks, 2020, pp. 177-182, doi: 10.1109/CICSyN.2020.40.
- [11] D. Bucher, V. Francisco, A. Amaro and I. Pedrosa, *Monitoring the business process using dashboards: The case study of an organisation from the research and innovation system*, 2020 16th Iberian Conference on Information Systems and Technologies (CISTI), 2020, pp. 1-6, doi: 10.23919/CISTI52073.2020.9476282.
- [12] A. M. O. Abdelsamad and A. Z. Karrar, *An Interactive Dashboard for Monitoring the Spread of COVID-19 in Sudan*, 2020 International Conference on Computer, Control, Electrical, and Electronics Engineering (ICCCEEE), 2021, pp. 1-6, doi: 10.1109/ICC-CEEE49695.2021.9429561.

The logo for IJRTI (International Journal for Research Trends and Innovation) is a large, light blue watermark in the background. It features a stylized lightbulb shape with a circular top and a semi-circular base. Inside the lightbulb, the letters 'IJRTI' are written in a bold, white, sans-serif font. The logo is centered on the page.

IJRTI