Department of Electrical and Computer Engineering
North South University

DIRECTED RESEARCH PROJECT (498R)

The Demographic and Health Survey Dashboard

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Fall, 2020

DECLARATION

This is to certify that this Project is our original work. No part of this work has been submitted elsewhere partially or fully for the award of any other degree or diploma. Any material reproduced in this project has been properly acknowledged.

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APPROVAL

The DIRECTED RESEARCH PROJECT entitled "**The Demographic and Health Survey Dashboard**" by **Md. Rabbi Amin (ID#1611233042)** and **Najmus Sakib Borson (ID #1610538642)** is approved in partial fulfillment of the requirement of the Degree of Bachelor of Science in Coputr Science and Engineering on May and has been accepted as satisfactory.

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First of all, we wish to express our gratitude to the Almighty for giving us the strength to perform our responsibilities and complete the report.

The direct research project program is very helpful to bridge the gap between the theoretical knowledge and real-life experience as part of Bachelor of Science (BSc) program. This report has been designed to have a practical experience through the theoretical understanding.

We also acknowledge our profound sense of gratitude to all the teachers who have been instrumental for providing us the technical knowledge and moral support to complete the project with full understanding.

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ABSTRACT

This article presents the strategies used for the development and implementation of a dashboard. Where this dashboard is a learning analytics dashboard designed, developed and evaluated in collaboration with medical survey report. That's why the overall objective will efficient for visualizing data of medical survey. Which can provide relevant support for all user of the system. This system available techniques are data visualization for real time which display all information as a visualization representative. In this paper we pickle a literature review of data visualization, its techniques and existing dashboard platforms. Our main target is showing that dashboards can become a unique and powerful to provide information visualization.

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CHAPTER 1

Introduction

Introduction

Technology, nowadays, is used heavily to solve our problems that we face. We have also witnessed a surge in the popularity of the use of dashboards. The world is growing like speed of light. In every business place information and technology taking the fast priorities day by day. For this reason, dashboard become more popular. Because dashboard is the technology where we can easily visually track, analyzes and display key performance indicators (KPI). Key data points are easy to monitoring the health of the business. There are so many needs for a company to visualization, prediction, analysis. Dashboard is the platform where we can do it very smoothly. Behind the scenes, a dashboard connects our files, attach, services and API's, but on the surface displays all this data in the form of tables, line charts, bar charts and many other graphical figure [1]. Dashboard is most efficient way to track multiple data source because it provides a central location for businesses to monitor and analyze performance [2].

Performance of dashboard is collecting the information and providing all-inclusive package for performance management. Such as strategy map, manageable solution [3]. Dashboard is the way to visualization the feature that's why there is fixed look that represent the dashboard. It is the growing movement to more learning environment [4]. More specifically, the field of learning and analytics focuses on tracking learning activities and the context in which these activities occur, to promote awareness and reflection through algorithmic analysis (educational data mining [5]) or information visualization.

Dashboard is typically used in the business setting. That's why it's use for so many business purposes like cash flow for better management (Schutle, 2006) [6]. Useful analysis tools which can help to professional journal stories report (Negash and Gray, 2008) [7]. Unisys' marketing dashboard improved the budget allocation, accountability, and performance management (Miller and Cioffi, 2004) [8]. This works given the dashboard more analytical performance. That's why it become more efficient for the next year working place.

A data dashboard is an information management tool that visually tracks, analyzes and displays key performance indicators (KPI), metrics and key data points to monitor the health of a business, department or specific process. They are customizable to meet the specific needs of a department and company. Behind the scenes, a dashboard connects to your files, attachments, services and API's, but on the surface displays all this data in the form of tables, line charts, bar charts and gauges. A data dashboard is the most efficient way to track multiple data sources because it provides a central location for businesses to monitor and analyze performance. Real-time monitoring reduces the hours of analyzing and long line of communication that previously challenged businesses. When we talk about dashboard it has three queries need to explain. These are Business questions answering, data tracked and dashboards interactive.

CHAPTER 2

Methodology

Introduction

In this report, the main objective is to examine patterns from a technological perspective of components used within the dashboard. The goal of this research is to heighten and brief some of the most advanced technologies used in demographic and health survey dashboard. Which will make people more aware. Especially in the medical sector. Through this medical dashboard it is possible to find various diseases based on the region. The method of analysis used a semi-cyclical mechanism adapted and based on a basic survey, finding and focusing the variations in technologies, and also their results and performances.

The planning stage made it possible to identify search strings and digital archives for study. The performance review process centered on each repository's adaptation search string, gathering preliminary results, extracting relevant data, and selecting candidate articles. Finally, in order to report the necessary observations and outcomes, a thorough review of the remaining paper was carried out.

Plan Phase

Before beginning a research process, this stage is connected to the initial setup. Its primary objective is to narrow the spectrum and achieve suitable results. First of all, in this analysis, the following research questions were identified.

- What are The Demographic and Health Survey Dashboard and variations in technologies?

- What system of this Demographic and Health Survey Dashboard?

The Above question related to our review paper on demographic and health survey dashboard. The question is so important for identifying the keywords as “Demographic”,” Health”, “Dashboard” and” system”, These keywords help to create a search string to find the initial findings.

Review Phase

Dashboard reporting more efficient for the user and the provider. It's provided and help the functional and visual design feature that's why it looks more efficient for all. It may be the graphical interface which make an easy platform to understand the measure the of business performance to enable managerial decision. It can automatically generated reports with Its data anytime anywhere [2]. No longer to user for gathering data or analyzing. Also, efficient format to the user like PDF, JPG etc. Also, can emailing and using any business purpose whatever we want. There so many types of dashboard we can see in resent life. But very few types of dashboard become more popular for its working purpose. Discuss about it-

Marketing dashboard:

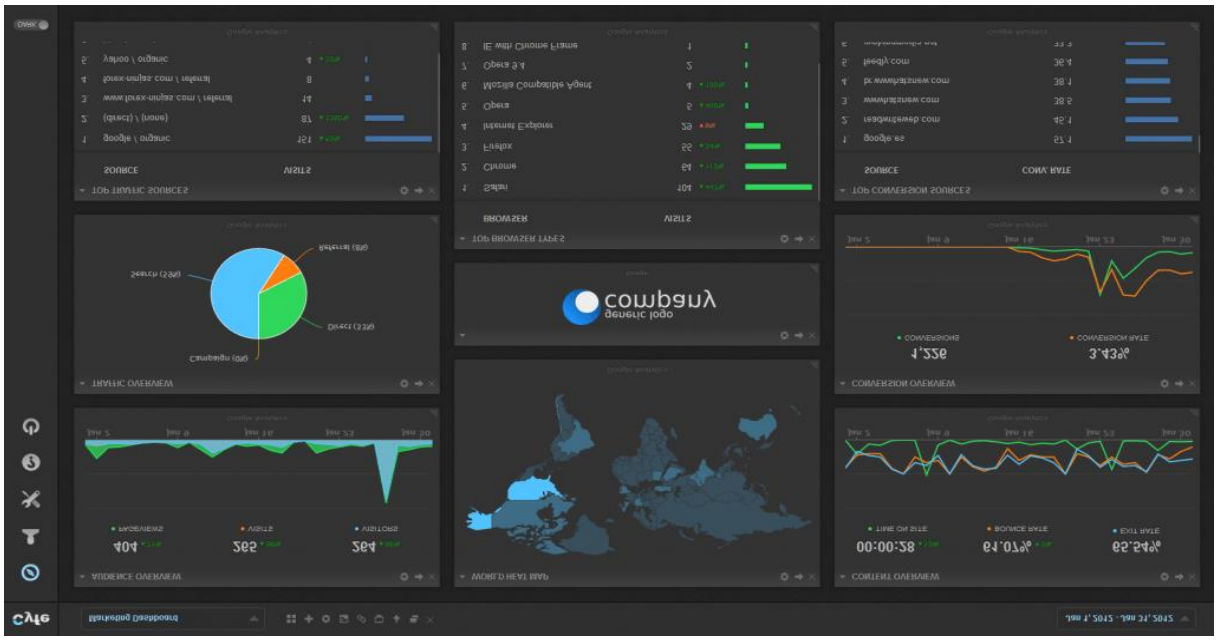


Figure 2.1: Marketing Dashboard (01) [9]

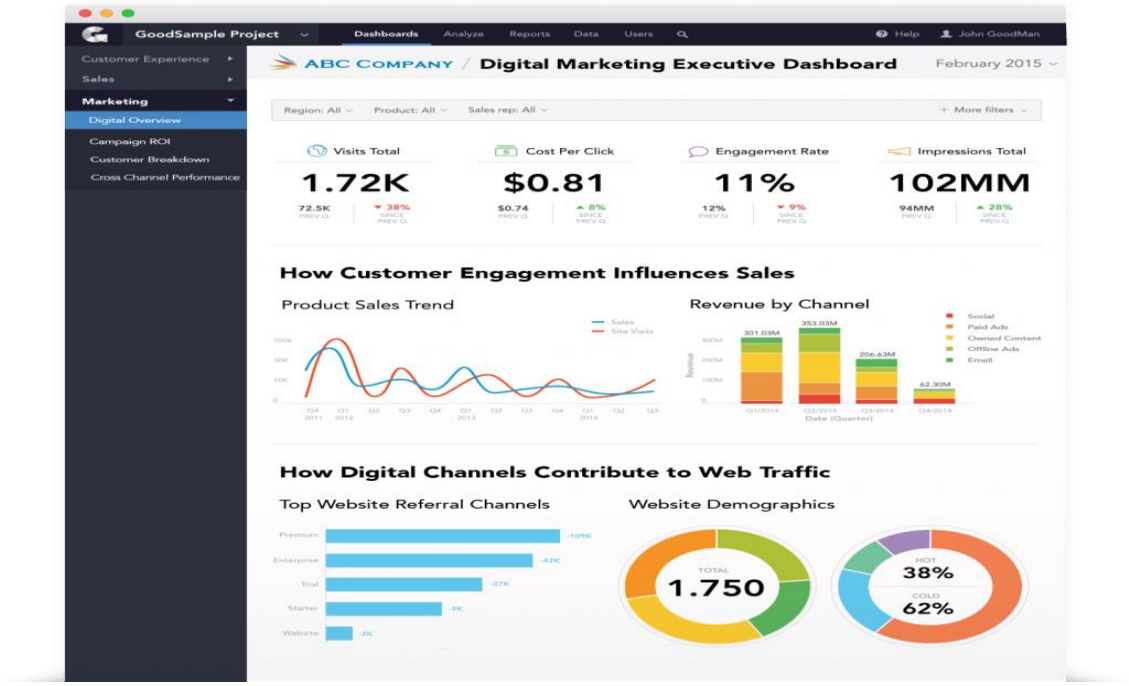


Figure 2.2: Marketing Dashboard (02) [9]

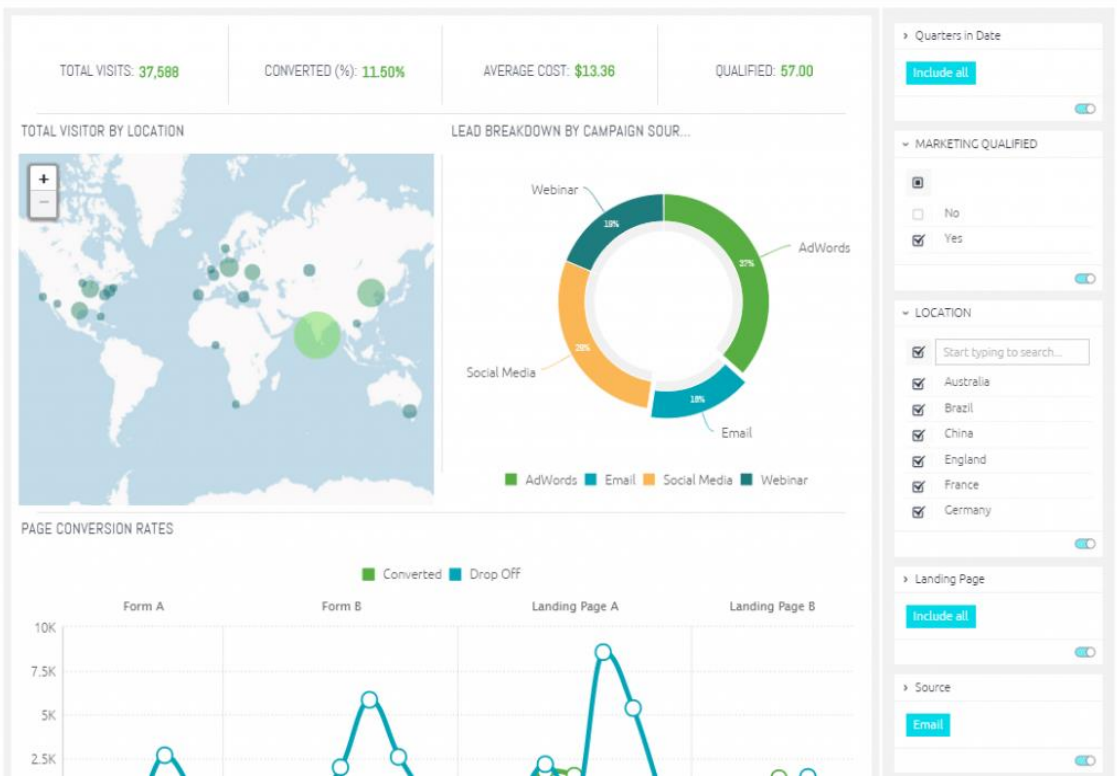


Figure 2.3: Marketing Dashboard (03) [9]

It's basically uses for the growth of the market, social review and demand of product, predict the farther product value etc. It's also made decision for the right product and the real time data analysis. There are so many companies who are using this kind of dashboard. It's also helps for the company for the future revenue. The most common and popular marketing dashboard are Cyfe, GoodData, SIsense, Tableau [9].

Sales Dashboard:

For this time, it also very important because of so many E-Commerce site in the whole world become more popular day by the. The list of the data and the list, client order everything need to visualization. For this reason, dashboard can do it very smoothly and easily. That's why it become more popular day by day [10].

Figure 2.4: Sales Dashboard (01) [10]

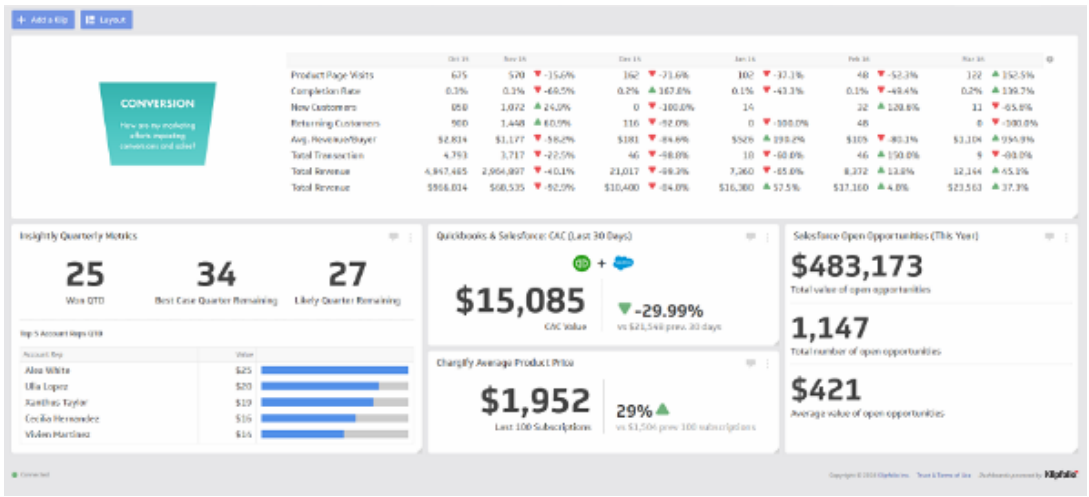


Figure 2.5: Sales Dashboard (02) [10]

The sales dashboard example illustrated above provides a perfect overview of the progress of the sales department by focusing on sales growth, sales targets, ARPU, CAC, and CLV. This visualization of every aspect of your sales portfolio affords you a unique opportunity to take a full picture of your sales operations quickly and easily, without losing any valuable information. A professional sales dashboard software will help you in the process, making your operations and sales data digestible, engaging the viewers to dig deeper and provide instant insights on your most important metrics and developments.

As a sales manager, they need to have at-a-glance information that can show them whether or not their team is meeting their individual goals. First, they can see whether or not their team is on track to meet their planned goals by looking at the sales target KPI. These insights can help plan for the future, create polished sales reports, as well as identify if sale team might need additional training. Using this sales dashboard template, anyone can gain an insight into how this sort of real-time sales monitoring can operational management and improve profit margins. [10]

Executive Dashboard:

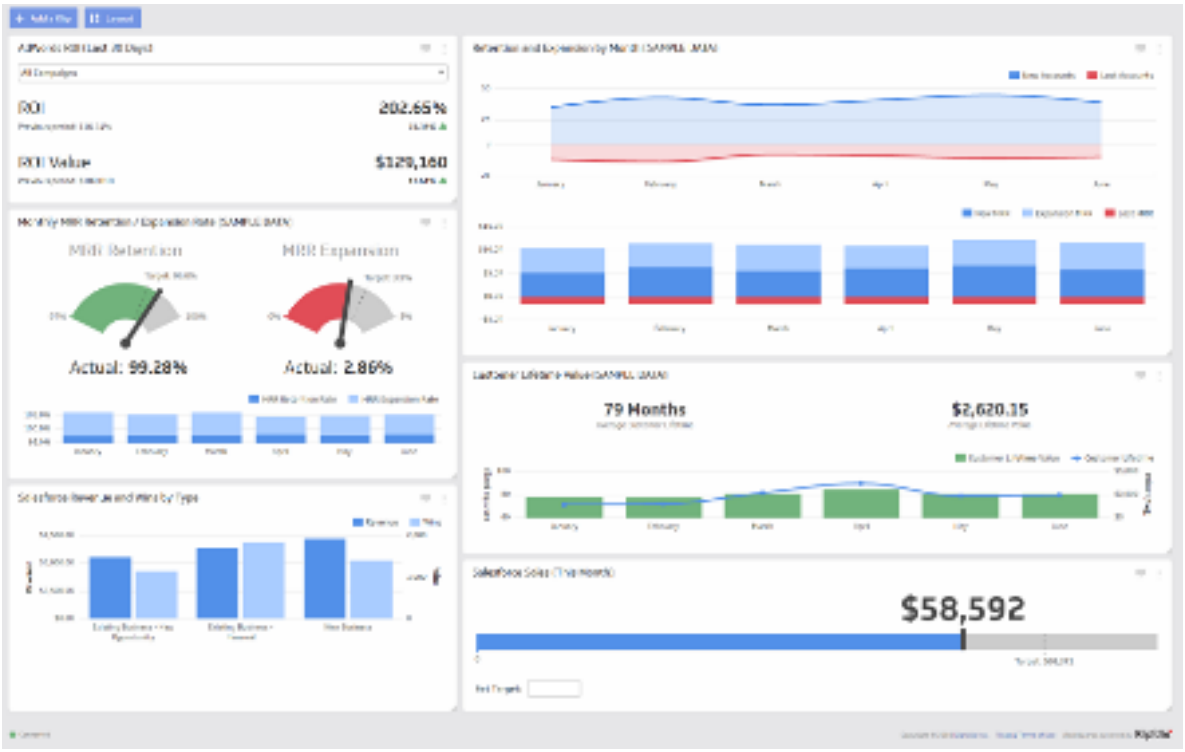


Figure 2.6: Executive Dashboard

Data dashboards are a powerful tool for executives because they summarize complex information and present it in an easily digestible way. For an executive, a data dashboard allows them to track, monitor and manage the most important metrics of the business [2].

n this Section, all the results are documented. These results have been used to build the next portion of this study. Furthermore, results were examined and discussed in order to develop and recognize patterns in the use of smart parking solutions' technical elements. Many systems, logic, and solutions have been proposed in [14-41].

CHAPTER 3

Demographic Dashboard

Introduction

Gapminder provides an online Dashboard to visualize the Demographic information and trends under one platform. The Gapminder is highly customizable and have almost every country's information enlisted here.

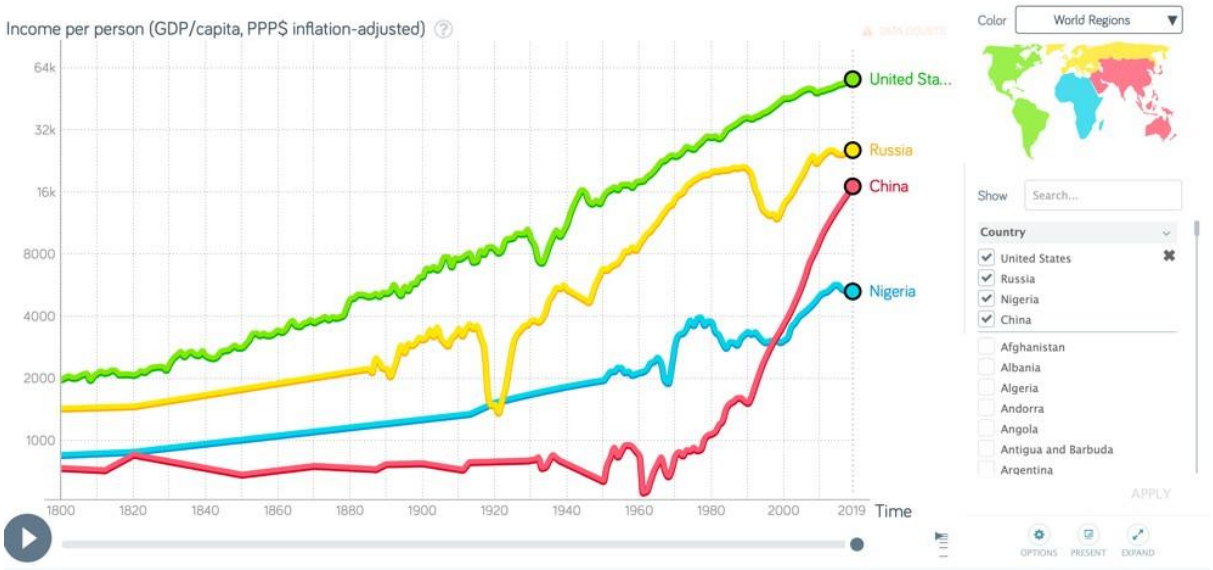


Figure 3.1: Demographic Dashboard

Proposed Work

In this project we're proposing a convenient way to interpret and visualize Demographic and health survey data from "The DHS Program". We intend to make a Dashboard system where we can visualize and understand the RAW data without having any technical knowledge of data exploration and visualization. Our main focus is to make an easy to use Dashboard that user can handle without or with very less technical knowledge.

Dashboard Features

In our Dashboard that we developed, we wanted to give a deep insight of the dataset under one platform. Just to name a few features that we can provide with our Dashboard are as follows,

- Glimpse of background Raw dataset in the main interface.

- Region wise survey report.
- Comparative Graphs of Regions.
- Pie charts of quantitative attributes.
- Bar plots of quantitative attributes.
- Attribute correlation heatmaps etc.

Development tools and frameworks

We've developed the whole project in python. We've used two python frameworks and several python libraries for the project. They are listed below,

- Dash: Dash is a python framework to build interactive Dashboards. Our whole project is based on this framework. Dash is built on plotly.js, React and Flask.
- Flask: Flask is a python framework for web development. We've used Flask for our UI design and development.
- Plotly: Plotly is a python framework that produces high quality interactive graphs and charts. Our all graphs and figures are generated with plotly.
- Libraries: There are few python libraries we've used for data preprocessing and web integration. They are pandas, NumPy, dash_html_components, io, base64 etc.

CHAPTER 4

Result

Introduction

In this section, various technology methods used to find a result of dashboard. By using dashboard of medical sector, it's very efficient to find a grated result. We see recently COVID dashboard which inform user COVID news update. This dashboard control by the WHO. Not only for COVID if dash use for all medical survey purpose that would be revelatory change for the medical sector. In this section we discuss about the result of our survey result.

We've successfully pulled off the whole project within due time. With our Dashboard we can now visualize and analyze the Demographic and health survey data from various perspective. Here are some glimpse of our work and their functions.

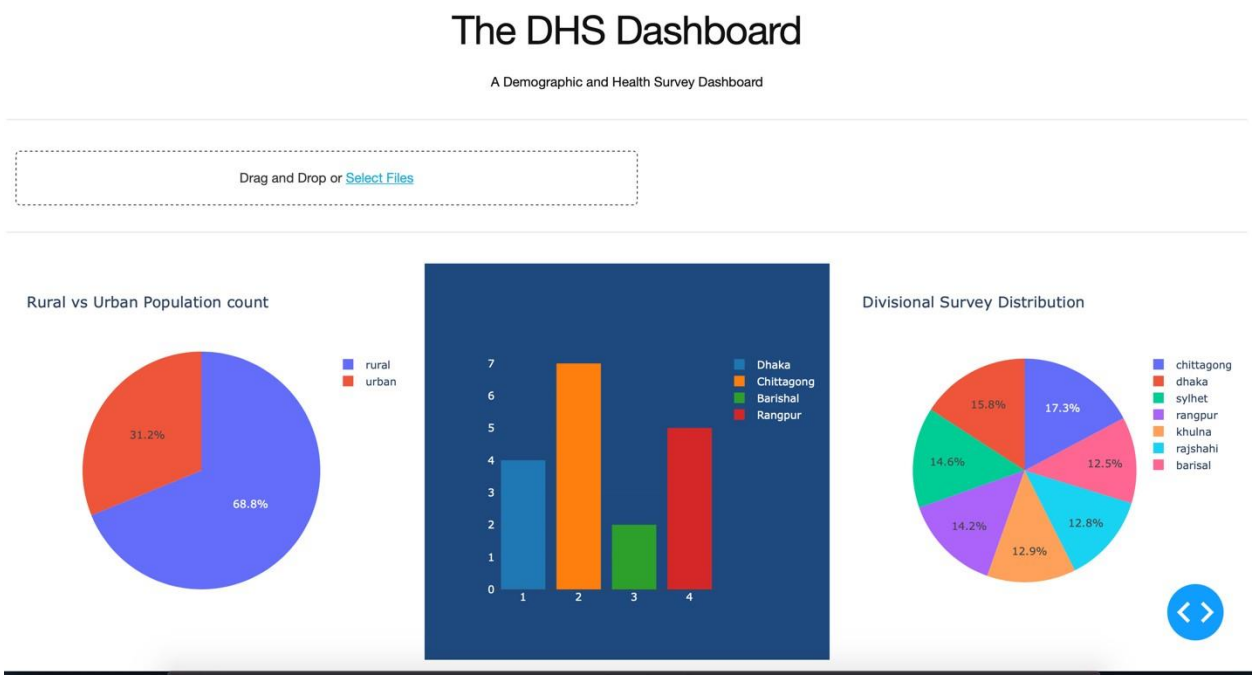
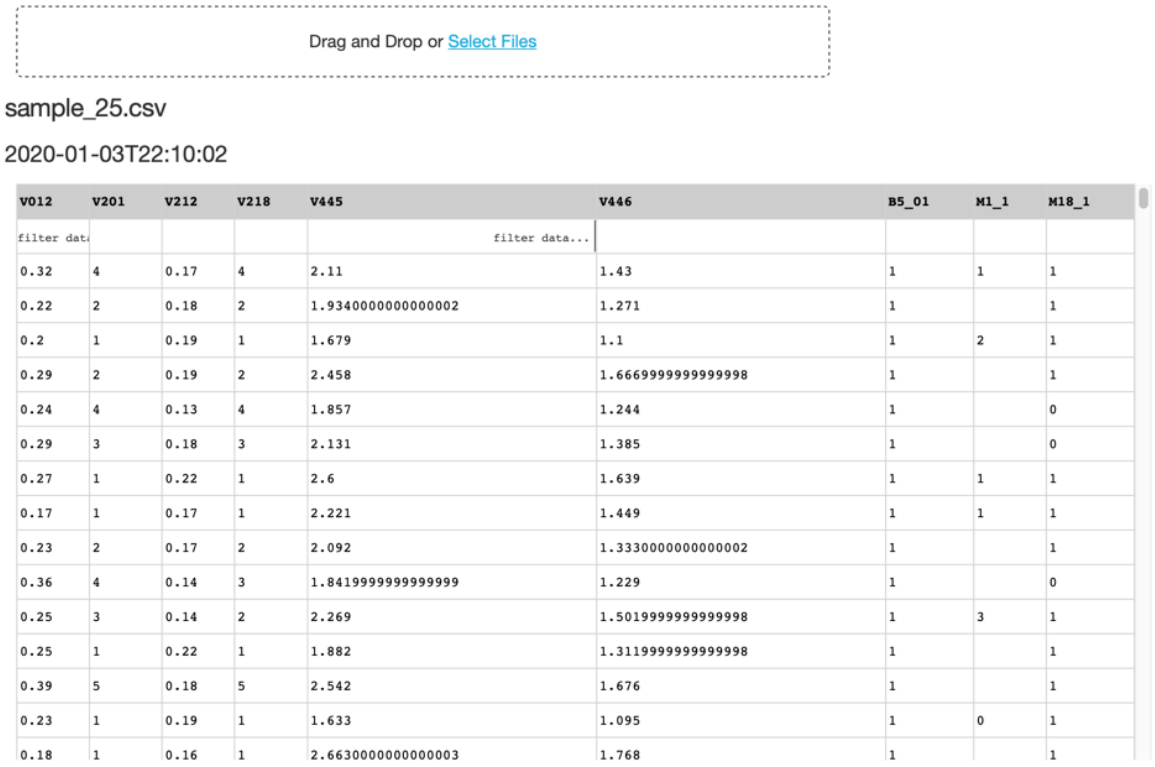


Figure 4.1: Glimpse of The DHS Dashboard

These charts are based on pre-loaded datasets in the background. The "Rural vs Urban Population Count" represents the percentage of counts of rural instances and urban instances of total population. The next bar chart indicates the maximum number of children recorded in the survey in a specific region in the following divisions. The "Divisional Survey

Distribution" represents the percentage of division wise survey instances of total survey records.



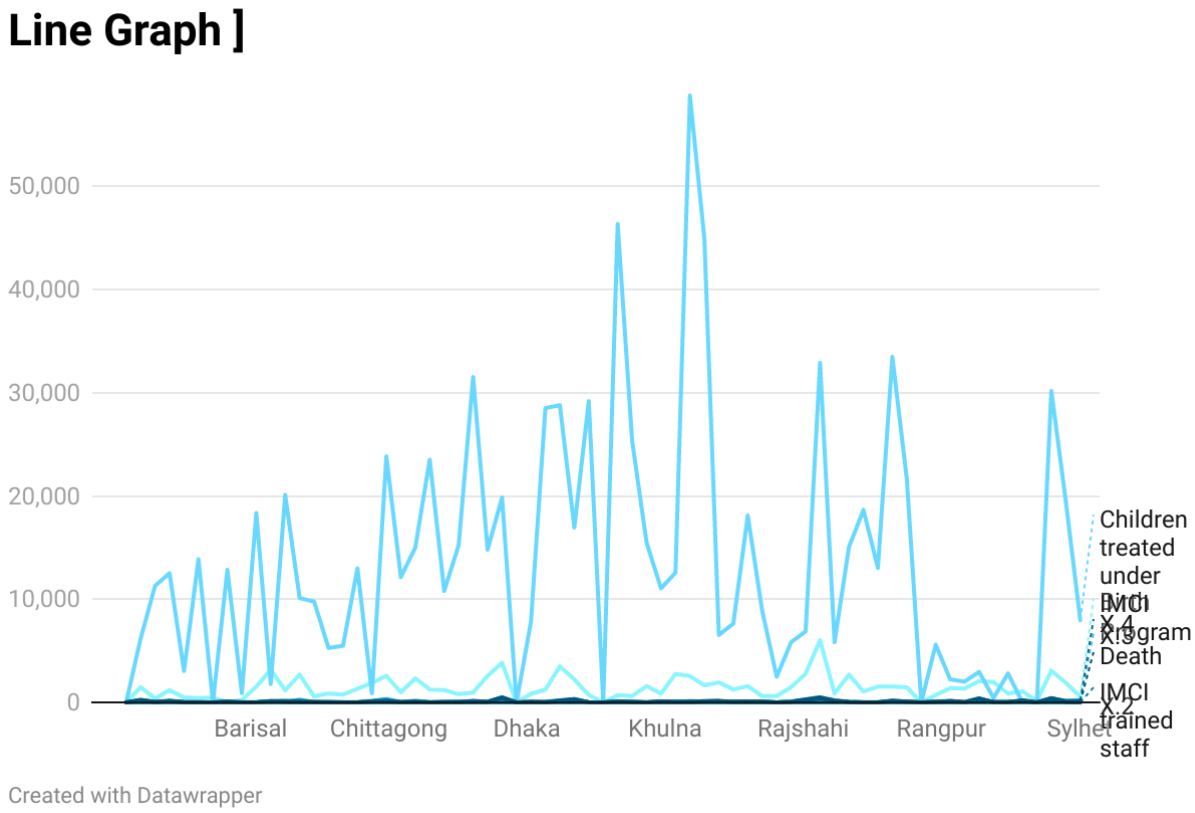
V012	V201	V212	V218	V445	V446	B5_01	M1_1	M18_1
filter dat				filter data...				
0.32	4	0.17	4	2.11	1.43	1	1	1
0.22	2	0.18	2	1.9340000000000002	1.271	1		1
0.2	1	0.19	1	1.679	1.1	1	2	1
0.29	2	0.19	2	2.458	1.6669999999999998	1		1
0.24	4	0.13	4	1.857	1.244	1		0
0.29	3	0.18	3	2.131	1.385	1		0
0.27	1	0.22	1	2.6	1.639	1	1	1
0.17	1	0.17	1	2.221	1.449	1	1	1
0.23	2	0.17	2	2.092	1.3330000000000002	1		1
0.36	4	0.14	3	1.8419999999999999	1.229	1		0
0.25	3	0.14	2	2.269	1.5019999999999998	1	3	1
0.25	1	0.22	1	1.882	1.3119999999999998	1		1
0.39	5	0.18	5	2.542	1.676	1		1
0.23	1	0.19	1	1.633	1.095	1	0	1
0.18	1	0.16	1	2.6630000000000003	1.768	1		1

Figure 4.2: Glimpse of The DHS Dashboard

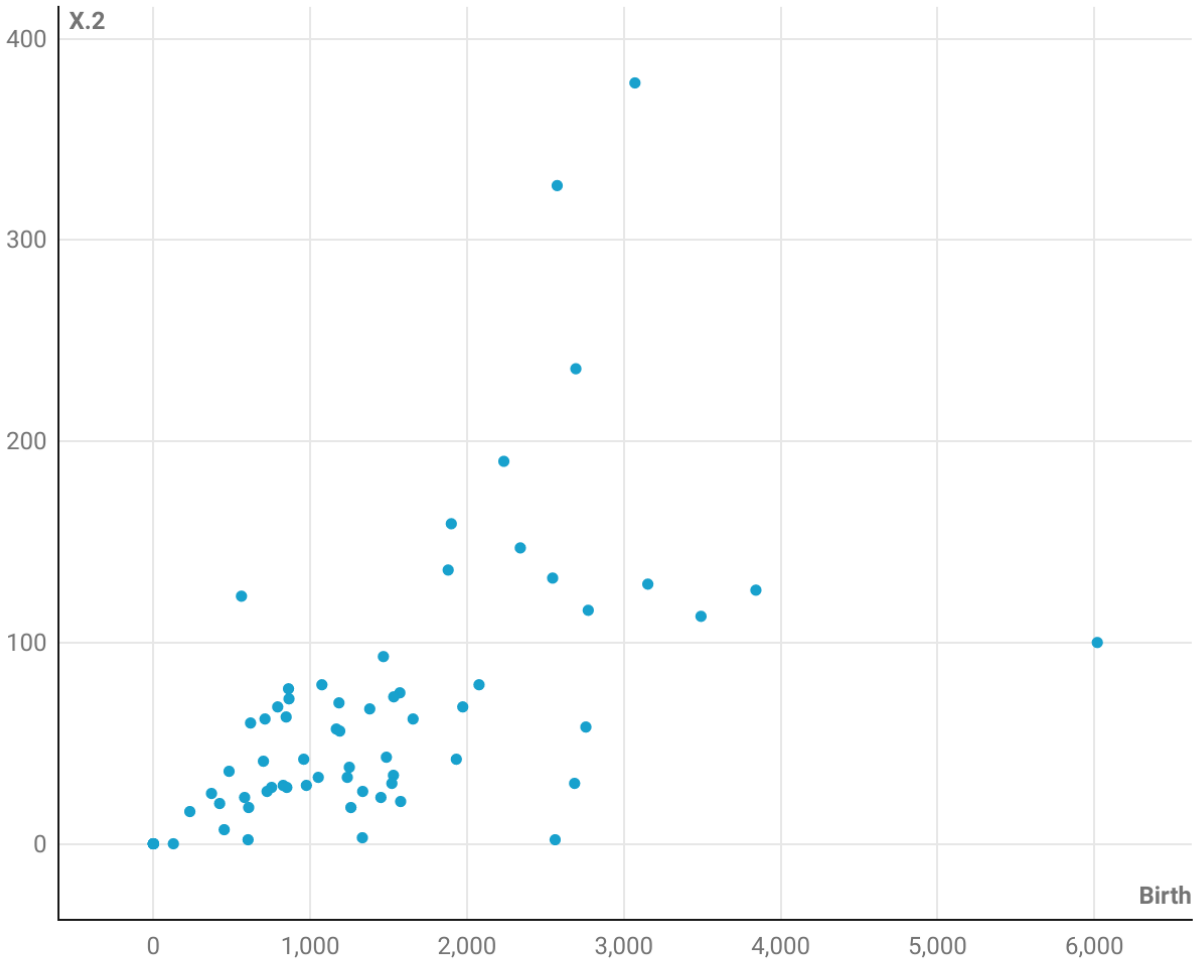
In our Dashboard we can also take a look of our dataset by drag and drop or by selecting it manually. We can also filter our dataset here by simply without writing a piece of code. Just to name a few these are the main features of the project. There are many other interesting features like these in our project.

Data Implementation and Data Analysis

The data was analyzed using simple percentages of respondents answering the various options. The presentation was made with the help of tables and charts. Conclusions were drawn on the basis of findings related to observations after analysis of data.



Scatter Plot]



Created with Datawrapper

CHAPTER 5

Conclusion

Introduction

In this section we discuss about the conclusion and future work of this dashboard.

Conclusion and Future Work

Dashboard is the new generation technology used in various sectors. It takes off the unnecessary hassles and complex coding for data exploration and visualization. Dashboard helps to take organizational decisions because it portrays the whole insights of data under one platform and it becomes easy to compare and analyze these data points.

This project is done under limited time and resources. There're always more scopes to improve the project. We've plans to extend this project further. More research can be done to explore the insights that have importance in our Demography and health sector. This will help social workers as well as governments to take further decisions based on the insights.

This study applied DG technology to an earthwork operation. This approach was unique in that the Dashboard technology was implemented in an undefined process of the earthwork operation. The study of dashboard provided a 3D graphic simulation environment where the virtual equipment configuration in the 3D earthwork.

We expect that data visualization will continue for the next few years to pursue and mature those trends that have already begun. Dashboards, visual analytics, and even simple graphs will continue to develop and conform to best practices. I also have seen evidence that newer efforts are emerging that will soon develop into full-blown trends.

One of these new efforts involves the delivery of dashboards on smaller screens. As a tool for monitoring what's going on, dashboards often need to be available when you are not sitting in front of your computer, which means that they must be accessible through mobile devices such as cell phones and PDAs. The greater space limitations of these screens place greater demands on the design of dashboards, which will force even greater research into effective ways to display maximum content in a small space. Research groups are already working on this.

BIBLIOGRAPHY

[1] Evaluating information "What is data dashboard" [Online]. Available: https://www.klipfolio.com/resources/articles/what-is-data-dashboard?fbclid=IwAR3Fe_-d3nPVnrM1-p6N0LHB-bKXk5xMzGU5u8Heu2RKLg0m_53b_juw5ps. [Accessed 20, May. 2020.]

[2] Klipfolio, "What is data dashboard" [Online]. Available: https://www.klipfolio.com/resources/articles/what-is-data-dashboard. [Accessed 4th August 2019].

[3] Ogan M. Yigitbasiongly, Onana Velcu, International Journal of Accounting Information Systems, 4th August 2011.

[4] "Vehicles, Air Pollution, and Human Health," Union of Concerned Scientists. [Online]. Available: https://www.ucsusa.org/clean-vehicles/vehicles-air-pollution-and-human-health. [Accessed: 05- Aug-2018].

[5] Saad, A. A., El Zouka, H. A., & Al-Soufi, S. A. (2016, March). Secure and Intelligent Road Traffic Management System Based on RFID Technology. In Computer Applications & Research (WSCAR), 2016 World Symposium on (pp. 41-46). IEEE.

[6] Pechenizkiy M, 2011. International Conference on Educational Data Mining. In ITS ROMANIA 2009 CONFERENCE & ECALL WORKSHOP, Eds. proceedings of EDM11.

[7] BBC, "BBC - Nottingham - History - The man who gave us traffic lights," 2009. [Online]. Available: http://www.bbc.co.uk/nottingham/content/articles/2009/07/16/john_peake_knight_traffic_lights_feature.shtml

[8] Thatcher, Linda, "Lester F. Wire Invents the Traffic Light - Photos and Stories — FamilySearch.org," 2013. [Online] Available: https://familysearch.org/photos/artifacts/2128625.

[9] "Communications standards news". IEEE Communications Magazine

[10] Chong, H. F., & Ng, D. W. K. (2016, December). Development of IoT devices for traffic management system. In Research and Development (SCOReD), 2016 IEEE Student Conference on (pp. 1- 6). IEEE.

[11] Azhar, S. 2011. Building information modeling (BIM): Trends, benefits, risks, and challenges for the AEC industry, Leadership and Management in Engineering 11(3): 241–252.