LEARNING DIARY

Data Visualization and Storytelling 1: Design Basics

BY-

Spoorti Basarkod Math

11038001

Since the first time I saw the course curriculum, I've been interested in the topic of data visualization and storytelling. With a particular interest in becoming a Power BI developer or data visualization professional, I am really excited about exploring the field of data analytics. Key Performance Indicators (KPIs) and easily cleansed data were the only things I knew how to work with throughout my six months as an intern Power BI developer. I designed dashboards and presented them to clients as my main duties in that position.

I now have a better understanding of the fundamentals of visualization thanks to this course, though. It has brought me back to the rudimentary stages of the visualization procedure. My primary responsibility as an intern was to create aesthetically pleasing dashboards for client presentations. I was used to receiving pre-processed data and KPIs. I'm starting to understand the nuances and principles of data visualization, which is enabling me to value the entire process more fully. With my goal of becoming a Power BI developer or data visualization specialist, in particular, I am sure that this information will play a major role in my development as a data analytics professional.

19th October 2023

Our course instructor was Professor Dr. Swati Chandna, who commenced the module by delving into the fundamentals of storytelling. According to her, storytelling comprises three crucial stages: creating context, developing a narrative, and concluding with a call to action. The definition of storytelling provided was enlightening: "Data storytelling weaves data and visualization into a narrative tailored to a specific audience in order to convey credibility in the analytical approach, confidence in the results, and a compelling set of insights that is actionable to the audience." This definition breaks down into three essential components: the integration of data and visualization, targeting a specific audience, and presenting a set of actionable insights.

Constructing an image in the mind from the available information is known as visualization. To create a meaningful story, it entails first extracting relevant information from the data that is presented, then processing this information to obtain knowledge. Information, knowledge, wisdom, and data are the main components of this process. Our approach begins with unprocessed data, from which we extract pertinent information, process it into knowledge, and then combine it into a sage and perceptive narrative. When converting unprocessed data into a story with nuance and significance, these four keywords—data, information, knowledge, and wisdom—form the essential steps.

The problem and solution spaces are the two primary domains in design thinking. Both the Define and Empathy phases exist in the Problem Space. Between the Problem and Solution domains, Ideate acts as a link. Testing and Prototype are the two stages that make up Solution Space. Potential solutions are created in a prototype, and those ideas are refined in testing by gathering feedback. This method aids in providing innovative solutions and analytical problem-solving.

Activities:

1. Toothbrush Activity: Today, we participated in exercises led by Professor Swati that aimed to simplify our comprehension of the design thinking method. We started the class with a toothbrush activity. She started out by telling us to sketch a toothbrush on a sticky note. My classmate Poornesh drew an electronic toothbrush, but most of us drew traditional manual toothbrushes. The lecturer then gave us an assignment to sketch an electric toothbrush. This easy exercise showed how different minds imagine ideas, even for everyday items like a toothbrush. It brought to light the variety of ideas in our class. When the lecturer asked us to elaborate, I understood how critical it was to visually remember specific details. This exercise was a good way to show how different interpretations can result in original and creative design concepts.

2. Can-opener Activity: The lecturer demonstrated various can-opener kinds and the kinds of persons who might use them. People came from diverse backgrounds and had varied needs, so we had to accommodate them and consider the needs of various can openers from their point of view. I learned how to empathize with individuals from this.

3. Why Activity: This exercise was done in groups. What "helps the students in identifying all the essentials needed on the campus" should be listed, the professor asked. Each of the five members of our group understood this question in a different way. The first bad decision I made was to quickly settle on one individual. Most of my group members thought it was incorrect when we mentioned the fundamental requirements that a university must meet and the fundamental needs of its students. We took the sticky notes and drew the items on the list before adhering them to the board. The lecturer then asked us to connect everything and create a story, which the group felt might have been completed much more effectively if we had understood the question correctly. In our group of five, there were three distinct interpretations.

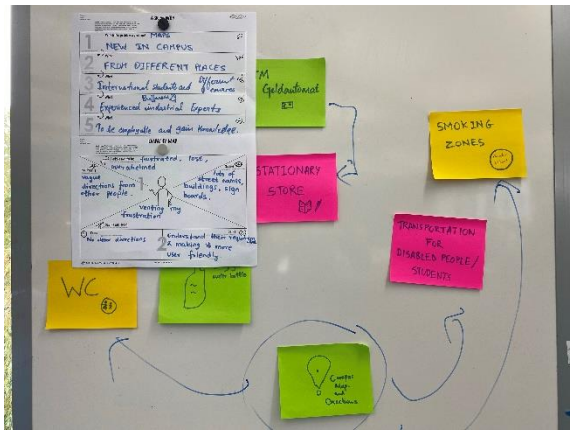

Image 1: Why activity.

When it was time for the second Why activity, the professor handed us a form that narrowed down our problem statement to the most basic requirement. In order to determine the most basic requirement, we had to develop five why questions based on the five whys on the list. There were a few conflicts in this section as well when creating the questions. We learned how to empathize with someone through this activity by trying to put ourselves in their shoes and asking probing questions. This exercise also showed us that reaching a conclusion as a team can sometimes be challenging.

4. Empathy map: In this activity, we chose a specific problem or need from a given story and developed an empathy map to understand its importance for students. The empathy map encompassed categories such as Hear, See, Think & Feel, Say & Do, Pain points, and Gain points. To gather insights, we conducted interviews with each other, exploring how individuals would respond in that particular situation. While engaged in this empathy map activity, we gained partial satisfaction with our approach. Subsequently, we held a discussion to identify areas where we could have performed better. This reflective conversation allowed us to recognize opportunities for improvement in our understanding and application of empathy mapping techniques.

To conclude the class, Professor Swati prompted us to form groups for the project presentation of this block. I joined forces with Kshema, Mercy, and Soumya. Our group's task was to select a industry, and we decided on Retail. The project involved interviewing people to gather insights into their shopping experiences within this domain. This choice set the stage for an engaging and practical exploration of user perspectives and needs in the retail environment.

After the lecture, we ideated questions which can be relatable to their shopping situation for the interview and decided to interview people individually and come up with 4 interviews.

Image 2: Ideating questions for Empathy map.

I chose to interview my owner's daughter in order to focus on a younger demographic. The purpose of this choice was to learn more about the shopping habits of younger people. Our main goal was to determine the fundamental causes of people's inclinations or dislikes about shopping. We used the 5 Why's and 6 W's method to probe further, asking a series of questions that gradually led to the underlying causes of their emotions and actions.

Image 3: Interviewing the user.

The initial phase of data analytics was demonstrated with this exercise and interview. We set the stage for data analytics by using techniques that look into the underlying causes of people's attitudes toward buying. Gaining insight into the underlying cause of their experiences helped us to make important findings.

26th October 2023

In the second lecture, Professor Swati began talking about the Empathy maps. Empathy maps of a few groups were discussed, and the professor gave us feedback to improve our empathy questions to understand the user better.

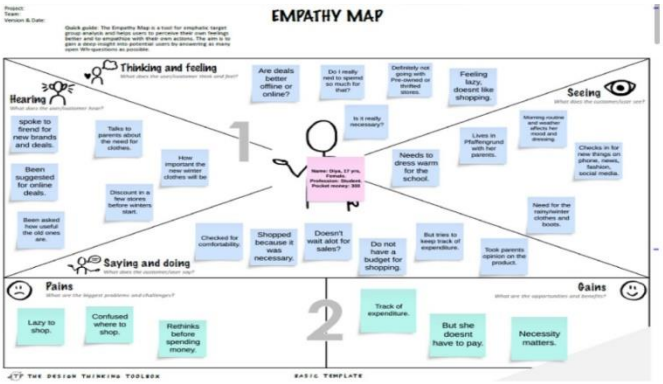

Image 4: Empathy map

The professor introduced the Define phase, where our task was to articulate the problem statement for our interviewee. This process began with defining the persona of the interviewee, unpacking their responses from the empathy interview, and crystallizing our point of view. By synthesizing the gathered information, we aimed to clearly articulate the challenges or needs that our interviewee faced. This phase laid the groundwork for precisely framing the problem we intended to address in the subsequent stages of the design thinking process.

Activity:

1. Persona: Prof. Swati provided us with a template that would make it easier for us to develop the user persona and comprehend the issue at hand. Determining their needs, tasks, interests, values, desires, pains, and gains from the empathy map were all part of creating a persona. We have twenty minutes to develop a persona.
   We proceeded to individually craft personas for our user, collaboratively leveraging insights from the empathy map. Summarizing these personas in three lines, incorporating all the empathy map notes, we aimed to distill a clear representation of our user. During a discussion with classmates, questions arose regarding why we had four Points of View (PoV's). It became evident that focusing on one empathy map and elaborating on its problem statement would have been more effective.

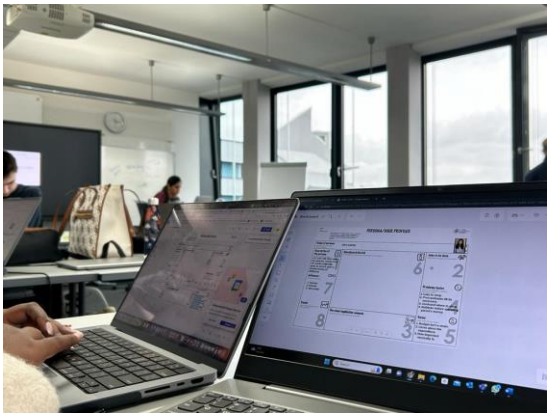

Image 5: Building Persona of User.

This realization crystallized further during the professor's feedback session. She highlighted that our PoV's were too narrow to extract meaningful information. An ideal PoV, as she explained, should encompass elements such as "How might we", "Action verbs", "Persona details", "The Topmost Need", and the "In order to".

Our initial statements lacked two crucial elements, making them too restrictive in understanding the broader scope of the problem.

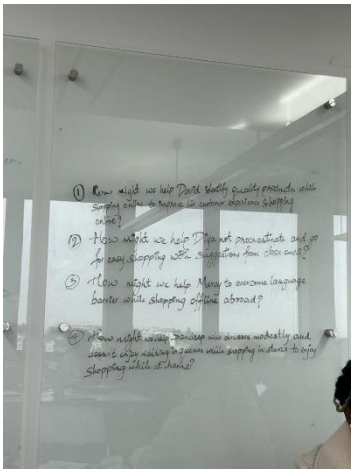

Image 6: PoV defining

Following the feedback, our group made the decision to focus on a single persona and define the Point of View (PoV) for that user. This streamlined approach aimed to enhance our clarity and effectiveness in addressing the identified problem during the subsequent phases.

Moving forward, Professor Swati transitioned to the Ideate phase, the third stage of Design Thinking. During this phase, she guided us on how to progress from defining the problem to generating potential solutions. The professor introduced a method to kickstart the ideation process, fostering a collaborative discussion on effective approaches to generate creative ideas for solving the identified problem.

Activity:

1. Crazy 8 Ideas: We have 8 minutes to complete a template with 8 ideas. Out of all the activities, this one was the most difficult. It was difficult to come up with a partial solution in eight minutes. We were limited to five workable solutions. We were happy with the outcome of our efforts.

After this activity, Prof. Swati took us through the other methods which could help us Ideate the solution part. The other ways to Ideate are:

a) 6-5-3 method: In this method, 6 people give 3 ideas in 5 iterations.
b) Dotmocracy: Here, all the ideas are presented, and the best ideas are voted by placing a dot on that idea.
c) SCAMPER: This elaborates to Substitute, Combine, Adapt, Modify, Put in another use, Eliminate and Reverse.

At the end of this lecture, we were able finalize our problem statement and almost get to the solution of the problem. We were given a home assignment to collect a dataset that properly fits into our problem statement.

02nd November 2023

Professor Swati covered the prototype stage, the fourth stage of design thinking, in this lecture. She underlined that early prototypes can be anything from a simple Lego model to a flowchart showing the suggested solution's basic user interface (UI). The development of concrete prototypes that enable an experimental investigation and testing of the proposed solution characterizes this stage. Before settling on a final design, teams can communicate and assess ideas in a variety of formats because to the flexibility in prototype selection. Professor showed us different types of prototypes:

a) Immersive research
b) Paper prototypes
c) Wireframes
d) Live version of data
e) Storyboards
f) Digital prototypes

Activity:

1. Prototype: We were given an assignment to construct a low-fidelity prototype following the presentation of the many types of prototypes. Our crew decided to create a Lego model and a pen-and-paper flowchart. Pavan was a recent addition to our group on this particular day. We took him through every step of our project, from empathy to ideation, and he assisted us in developing a working prototype. Using Legos, we built a miniature virtual fashion assistant. After that, we gave it to the class and welcomed questions.

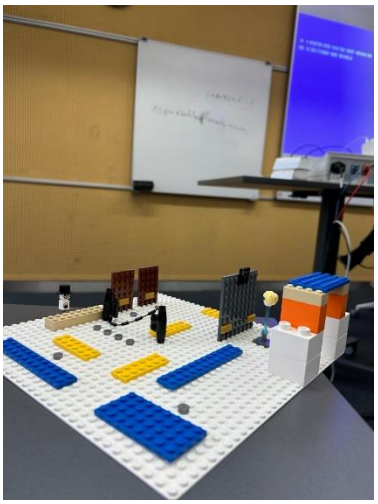

Image 7: Lego Prototype

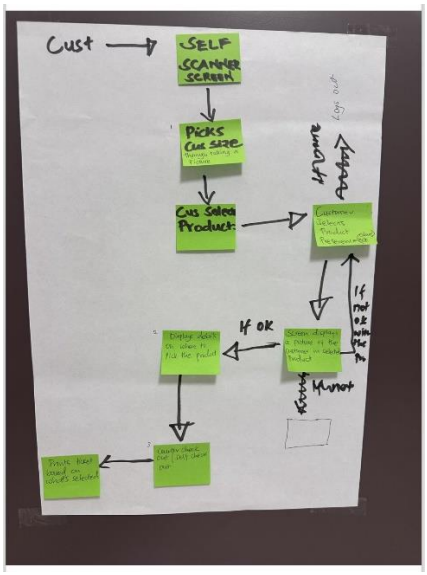

Image 8: Flowchart prototype.

Following this exercise, the professor walked us through how to begin the testing step. A few others noticed when the professor placed caps on their heads at random.

Activity:

1. Hat activity: The colored hats depict a role that person must play in a situation.
    a) White hat- Facts
    b) Yellow hat- Optimist
    c) Black hat- Devil's advocate
    d) Red hat- Emotional
    e) Green hat- Idea generator
    f) Blue hat- Manager

The situation they were given is Diwali celebrations that was happening next day.

We then had to use this testing method in our project to come to a proper solution.

06th November 2023

In this lecture, we initiated the data preparation and dashboard creation process with the guidance of Mr. Ralf Storch, who assisted us in ideating with various graphs. Since we couldn't find a pre-existing dataset that precisely matched our problem statement, we took the initiative to create our own columns tailored to our needs, utilizing Python programming.

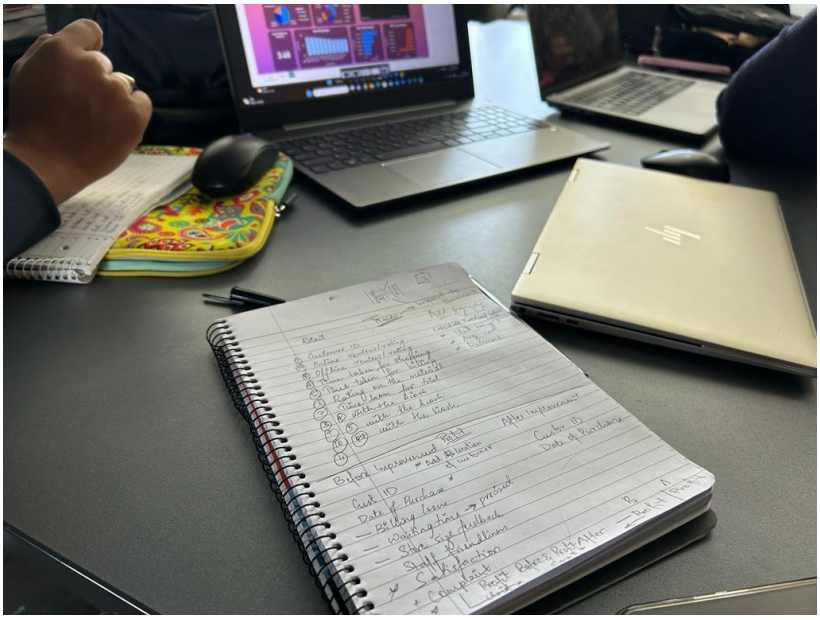

Image 9: Data preparation.

During this session, we comprehensively explained the entire process, covering all the classes taught by Professor Swati, to our teammate Pavankumar. This knowledge sharing ensured that everyone on the team was aligned and equipped with a clear understanding of the tasks and methodologies employed in the project.

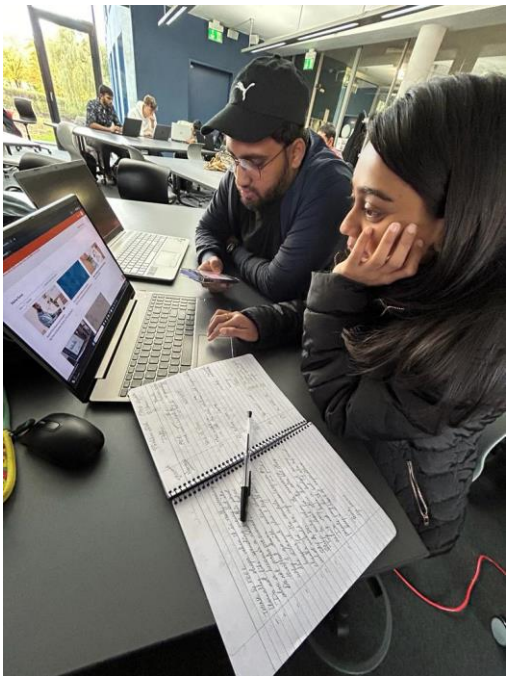

Image 10: Familiarizing Pavankumar with project.

The preparation for our exam/presentation posed a significant challenge due to the incompatibility of our data with the desired solution. Prolonged disagreements arose regarding the approach to creating graphs and a dashboard with the limited data at our disposal. Recognizing the need to step back, we temporarily shifted our focus from the dashboard and devoted time to preparing prototypes. These prototypes aimed to demonstrate how our proposed solution would function, providing a tangible illustration of its working mechanism. This strategic pause allowed us to present a clear and concise vision of our solution during the examination or presentation.

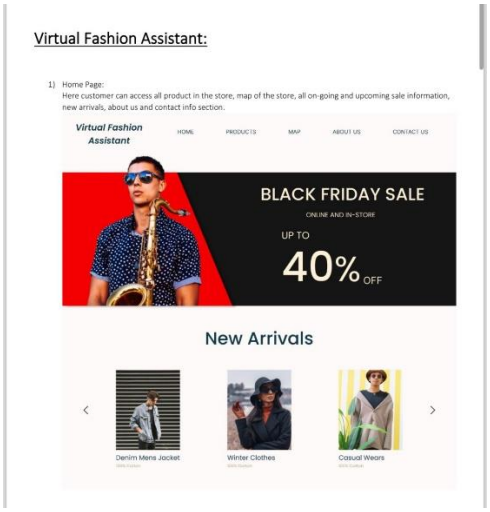

Image 11: Prototype

We struggled with a Design Thinking loop because of difficulties with data preparation as we worked through several trial-and-error techniques in our last presentation preparation. We had to simplify our process because the self-generated data we used limited our options. We persevered in honing our concepts despite the obstacles we faced, using Design Thinking's iterative nature to modify and enhance our solution. Our presentation was finally fashioned by this trial-and-error process, which enabled us to demonstrate the best result considering the limitations we faced.

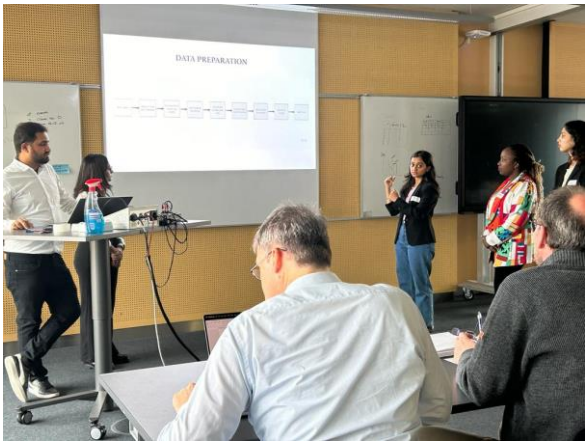

Image 12: Presentation.

Following the presentation, we took a moment to reflect on our performance and carefully considered the feedback provided by Mr. Frank Schulz, Mr. Ralf Storch, and Dr. Prof. Swati Chandna. This reflective session allowed us to pinpoint areas where we may have faltered and comprehend the valuable insights and suggestions offered by our instructors. By analyzing the feedback, we aimed to identify specific areas for improvement, facilitating a more informed and constructive approach to future projects or presentations.

Image 13: Discussion after the presentation.