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Investigation of the Concept of Empathy in User Experience Design

Submitted By:

Soniya Subba Begha

Student No:64846

Submitted To:

Benedicte Frederikke Rex Fleron

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Abstract

This research paper studies how the system for the restaurant business can fulfill the need of the central stakeholders. So, the principal purpose of this thesis is to develop a system design of Kebabish ApS using the theory of empathy. This study uses a combined approach of design thinking process and empathic design framework. To collect the data from several collection methods like focus groups and interviews were conducted with end-users of the system. For the evaluation of the information architecture of the proposed design, an online software tool for card sorting has been used with the users. The study in the user experience design expresses that there is an enormous gap between users and designers. So, to build a strong relationship between users and designers, this study used an empathic design and participatory design approach to deal with this issue. This research is aimed to apply an empathic concept in user experience design for users and designers of the websites.

For this study, wireframes and mockups have been used to see how these tools can create empathy among the stakeholders. Focus groups and interviews were conducted to understand their thoughts about these designs. And to collect the participants' opinions about the structure and menu of the website an online card sorting method has been used. The results from the data analysis in this research display that the use of the empathic approaches along with other approaches of usability and design, in user experience design, can strengthen the relationship between users and designers and also helps designers to design the product as their users' desires and expectation. So, the empathic design approach not only helps designers learn more about their users but also helps to connect emotionally with their users which is beneficial for the construction of a successful product or service.

List of Figures and Tables:

Chapter I: Introduction

This chapter introduces the concept and structure of the thesis. This chapter starts with the purpose of the study. This chapter also summarizes a case and a case company (Kebabish ApS). Further, the problem statement is also described in this chapter that highlights the importance and relevance of the subject. The research questions are used to describe the principal aim of choosing the thesis topic.

1.1 Purpose of Study

The primary aim of this research is to design the website for employees of Kebabish ApS using the concept of empathy which will help the employees to perform their work more effectively and efficiently. This system also aims to provide a user-friendly system design for the employees to track their schedules, their working hours, vacations and for the manager to create a schedule and manage the information of the employees that includes their personal information like their mail id, address, CPR no, and their visa details. The proposed system will use a web-based application design with a clear, intuitive, and easily searchable design so that the users could adopt the system and make the maximum use of it. So, this system will function as a common platform for the manager and the employees.

1.2 Introduction of a Case Company: Kebabish ApS

Kebabish ApS is an Indian restaurant at Vesterbrogade near central Copenhagen. The owner of this restaurant is originally from Pakistan, but now he is a Danish Citizen and his name is Mr. Nazakit Mahmood. He started this restaurant in 2010, which has its popularity among people from different nationalities, especially Danish, Pakistani, Indian, Nepalese, etc. The restaurant is open every day for almost 13 hrs. On weekdays it opens from 11 am to 12 pm (Monday to Thursday), for weekends (Friday and Saturday) it has more working hours from 12 pm to 2 am and on Sunday, the restaurant opens at noon and closes at midnight (Kebabish ApS, company website). 20 employees are working in this restaurant and the employees are from different nations like Egypt, Iraq, Denmark, Pakistan, Bangladesh, Turkey, and Nepal. Most of the employees are full-time workers whereas some of them are students so they work as part-timers. As there are different nationalities in this restaurant, this is a kind of multicultural company where the employees can share their cultures, lifestyles with each other. The key food partners with whom Kebabish ApS is working are the Mughal Food Store and Full house Foodservice.

The specialty of this restaurant is it prepares Indian-inspired food with fresh ingredients and with a powerful influence on the Mediterranean food culture. This restaurant serves varieties of delicious dishes at an affordable price. Since it is in central Copenhagen, the customers of this restaurant are mostly tourists and local people nearby. This restaurant also provides a relaxing and cozy environment to the customer with its wonderful ambiance and dedicated staff. Because of some special dishes such as butter chicken, grill, this restaurant has become successful to make many people as their regular customers. Since the owner of the restaurant is from Muslim religion for the drinks, the sodas and fresh juices are only available. The basic purpose of this restaurant is to attract almost everyone to make them visit once first and make them regular by giving them wonderful service with delicious and hygienic food. The menu of the restaurant covers almost many customers, like from kid to grown-up person. There is also a takeaway facility to the customers if they want to have their food delivered at their place. So, the motto of this restaurant is to make each customer happy and satisfied (Kebabish ApS, company website).

To make the business successful considering the happiness of customers, this restaurant also applies several market strategies. The restaurant takes care of its customers by offering them some discounts frequently and for regular customers, they always provide them a discount on each visit. Like when there are big occasions like Ramadan (religion of the Muslim community), Christmas they offer from 10% to 15% discount on their total bill. Not only on religious occasions, when there is a big group reservation (birthday, congratulation program) the restaurant not only offers them discounts but also offers them some dishes or drinks as a service from a restaurant. In 2-3 months, the restaurant organizes some online games like quizzes, lucky draws, etc. on its social pages like on Facebook or its website and they award the winners with the meal coupon for max 3 people.

1.3 Introduction of a Case: Website for employees of Kebabish ApS

Kebabish ApS has its own restaurant's website where it has different pages with specific information on specific pages. The website contains a description of the restaurant, menus, and opening hours. The key purpose of this website is to let customers know about this restaurant and its specialties and they can order the food online through YOYO and Just Eat. The reason for choosing to work with this company is that in this company there are some works still done manually instead of digitally. Like now in the market, we have different applications like Planday, Tamigo, etc. These are the popular online employee scheduling software that most of the companies in Denmark use. Planday is an application that is specially designed for making the work-life of employees better and easier. For mobile applications, it is available for both iOS and Android (Planday website). Since the restaurant is a small-sized company with few employees, the owner of the restaurant does not want to increase the cost by buying the applications available in the market. As I am also an employee of this restaurant, when I had a meeting with my manager at the beginning and when I explained my research topic and the purpose of doing a study on the website development for the employees, he showed an interest and encouraged me to work on it.

In this paper, I have tried to include some problems associated with the manual process like the manager is still using pen and paper for making the work schedule and the staff are also submitting their hours by writing them on the paper. The manager makes or changes the schedule of the staff if there is any extra staff appointed or if someone left the job. If one of the staff wants a leave from work, that staff has to inform his or her manager so that the manager can manage someone in that staff's shift. Though now they are using a digital tool or a technology as a medium of communication, still there is no particular system for making a formal request for a leave and also no formal approval from the manager. Besides this, if some important notices need to be delivered to all the staff then, these notices are sent through WhatsApp where the manager has created a group named 'Kebabish DK' where he has added all the staff. WhatsApp is an internet-dependent software application available for both iPhone and Android smartphones. This application is used to send messages(audio/video), have a group chat, or an individual chat between WhatsApp users (WhatsApp website). So, this is the latest medium of communication used between the restaurant manager and employees, though it is not an official way to deliver any important company messages and notices in this kind of social networking applications.

As per the discussion with the stakeholders, they want a website where there are simple features easy to carry out their basic tasks. Specifically, they want a system where they can efficiently work on their daily tasks, which will improve their working environment. They want to fit in the trend and want to develop themselves in the digital work practice. Since I am also an employee

of this restaurant, I can understand the problem we are having now while working manually. Some problems we have faced till now are every day we have to write our working hours in some paper or notepad and if we forget to write it, then it means we will lose some of our hours at the end of the month. This is an enormous loss to the employee because he/she will be paid based on their submitted hours. As we are using an app called WhatsApp to send or receive text messages, it manages communication between the colleagues, but while working in a company it is not a formal way. Now if anyone wants to change the shift or need a leave from work, he or she informs the manager and colleague through a call or a text message. By doing this, the person who is asking for a leave feels he or she has fulfilled his or her responsibility but if another person whom he or she has messaged cannot receive that message and doesn't show up during the time of work, then the manager won't be able to distinguish who has done this mistake. This will lead to a problem in a relationship between employer and employee and also between one employee with another employee.

Not only the scheduling problem, but also there is no such place to get much more information about the restaurant, though there is a company website. The website of a restaurant contains basic information like a restaurant menu, opening hours, address of the restaurant, etc. and also a brief description of the restaurant. If a newly recruited employee wants information like the rules and regulations of the restaurant, main tasks of the specific job position, contact details of the manager, etc. then they have only one option, they can ask the other employees who have been working there for a long time. These are some problems which are happening frequently in the restaurant and each member of the company wants to be out of this problem and wish to work more professionally. So, the purpose of building a website is that employees can have all this information in one place, and they can perform all the tasks regarding their scheduling, vacation, etc.

1.4 Problem Statement

The problem statement describes what is the reason behind choosing the topic for the thesis and why and how the research problem statement matters to clarify the subject as per the theoretical context and find the reason for the use of research questions to look out the importance of the study. So, this problem statement is the sole concept that determines the overall content of the entire thesis report. Building a website is one part of my study, and the crucial part of my research topic is the role of empathy in the design process. Throughout my education in Computer Science subjects, I learned and did many works in unfamiliar areas and these works were somehow related to the concept of empathy. In my previous projects also, I met with my users or stakeholders and had several meetings with them to talk about their vision and goal from this specific project. This taught me that as a developer or designer we should meet up with our users' needs and wants while delivering the ultimate product or service to them, but I was not much familiar with the concept of empathy.

The specific reason to have the problem statement is directed towards the impact of empathy in the designing process. For this theoretical matter used will specify why empathy is important while developing a website for the company. We can see that people are now fully dependent on the internet and modern technology. There is not a single thing or task which can be done with no help from the technology. I believe this report prepared by my research will add more value and fresh ideas to the topic that I will write about. I am trying to study and use the concept and the tools of empathy to design a website for a small restaurant. The reason for doing this task is to

go deep under my thesis topic and use the knowledge I gained theoretically in the practice that means in the actual world.

1.5 Research Questions

The following are the research questions that are used to describe the impact of empathy in the design process specifically while designing a website for the company. These research questions are illustrated to support the problem statement of this paper as it would make the analysis easier and would support my research.

RQ1. Who are the main users of the proposed system of Kebabish ApS?

RQ2. What is the impact of empathy in the design process?

RQ3. What skills do a designer need to become a more empathic designer?

1.6 Framework of the study

Chapter I:

This chapter comprises a brief description of a case company and the research subject (website for the employees of Kebabish). This chapter presents the aim of performing this study followed by the problem statement and the research questions regarding the thesis topic.

Chapter II:

This chapter includes a literature review which deals with various descriptive research that is done by multiple scholars and institutions in user experience, user experience design, empathy, empathic design, HCI, HCD, participatory design, and design thinking.

Chapter III:

This chapter comprises a research method where we have identified qualitative and quantitative as our research approach for analyzing our data. We identified our case as a single case study as our research design and data collection method comprising a primary and secondary data.

Chapter IV:

In this chapter, we have summarized the overview of findings from the data which comprises tables. This provides us the data that we need to analyze for our research. We have partitioned the analysis into usability testing (card sorting method) and interviews.

Chapter V:

This chapter contains the major discussion we had from the original theories and data we have collected. And the conclusion we provide is the answers to our research questions.

Chapter II: Literature Review

In this chapter, we will present the critical review and the comparison of origin research, ideas, and theories by various scholars and further design opportunities in the user experience design field. We will review several features of user experience design to have discussions about the happenings in the user experience design process to figure out the possibilities. Besides, we will also review some literature about empathic design, and the theories related to it. Since the key focus of the research is empathy, we will also review the literature and research questions related to it.

2.1 User Experience

Before getting into the concept of UXD and empathy, we should understand the concept of User Experience (UX). According to ISO 9241-11 (2010), "User Experience is a person's emotions and attitudes about using a specific product, system, or service." This definition focuses UX on instant results and expected use of a product, system, or service. UX comprises an individual's belief or judgement of characteristics of a system like usefulness and productivity. When a person uses some products, systems, or services then he or she will have some reaction that may be positive or negative but that is also a kind of experience that a person will make. Not only the reaction but the feeling of happiness and satisfaction or unhappiness and dissatisfaction that occur before, during, and after the usage of the product, service, or system also builds an experience. (Hassenzahl, 2008). In the same way, Law et al. (2009) in their article have suggested that defining UX as an individual thing that occurs when there is an interaction with a product, system, service, or object. They stated that UX is a combination of a wide range of vague concepts like experimental, emotional, affective, hedonic, and aesthetic variables. So, this is also a reason that is making it difficult to get a universal definition of UX. After conducting an online survey with the researchers and practitioners from academia and industry, the authors concluded that the concept of UX is dynamic, subjective, and context-development.

Similarly, according to Roto et al. (2011), the term 'User Experience' is popular and used in different fields so it has different definitions depending on the areas it is being used. They have claimed that UX can be seen from unique perspectives such as a phenomenon or as a field or as a practice. UX as a field of study tells about the creation of UX by discovering the resources to design systems that support specific UX. UX as a practice is used to test UX, picturing UX as a part of design practices. And UX as a phenomenon explains what UX is and what it is not by recognizing distinct types of UX. It is more specific as UX encounters with the system not only actively but passively. An active way is when a user is using the system for personal use and a passive way is by looking at someone who is using the system. We can take an example from our daily lives when we are doing some tasks for our personal use then that is an active way of experiencing and when we are seeing a friend or family using a system, then that is a passive way of experiencing. About what UX is not, according to the authors, UX emphasizes more on humans rather than technology. This does not mean it is about a single person who is using a system alone. UX is about the experience of using a system or product. According to ISO 9241-11 (2010), the definition of usability is: "the degree to which such users may use a product to attain such aims with effectiveness, efficiency and satisfaction in a particular set of practice." Though usability is an important feature of UX, it differs from UX as in usability there is no compulsion that humans only use the system, automated systems are also there like smart home notifications, self-driving cars, home appliances, etc. So, it relates UX and usability to each other, but they are not similar.

To show that UX and usability are not similar, Hassenzahl et al. (2006) have presented three major differences to show that UX is ahead of the traditional view of usability and they are:

- **Holistic**: The focus of usability is on task-related (pragmatic) features and their achievement whereas UX considers a holistic approach that involves non-task related (hedonic) features of product ownership and use such as challenge, beauty, motivation, or expressiveness.

- **Subjective**: Having its roots in cognitive psychology and human aspects, usability is an 'objective' approach, usability evaluations and usability methods stand mainly on observation when there is an interaction of participants with the product. UX strengthens the 'subjective' approach. It concerns how people experience and review the products they use. So, it means that the outer look of the product may not matter objectively, one needs to have a subjective experience of the quality of the product to have the impact.

- **Positive**: While in a traditional view, usability emphasizes problems, obstacles, dissatisfactions, or pressure, and the method to overcome these. UX emphasizes the positive consequences of technology use or ownership like positive feelings such as fun, satisfaction, pleasure.

In the same manner, according to Battarbee and Koskinen (2005), to have a better understanding of user experience, they have introduced three approaches of UX. These approaches are the measuring approach, the empathic approach, and the pragmatic approach. The measuring approach refers to those features of UX that can be measured, analyzed, and enhanced through measurement. This approach is useful in the developing and evaluating phase. The empathic approach which develops on motivation is accomplished from a deep understanding of the user's experiences, dreams, hopes, and life setting and is created through a significant emotional meeting between designer and user. The third approach is the pragmatic approach that refers to those experiences that are created by an interaction of an individual. Thus, the measuring approach emphasizes on emotional responses, the empathic approach emphasizes on user-centered concept design, and the pragmatic approach emphasizes on the act. The authors have claimed that the mentioned three approaches are self-centered, so they have used the term 'Co-experience' to give a new meaning to the experience when all persons' experiences are combined and shared in a social context.

Also, Hassenzahl (2013) has mentioned that the user experience is not about the outer look or appearance of the interface, but it is about going beyond the material. When anyone interacts with any product or service, then there is a creation of an experience. Experience is not only about the possession of things, but it is also about having a positive experience. This does not mean that we only have wonderful experiences with the product or service sometimes we can also have negative experiences. These kinds of experiences help us be aware of that product before using it again. So, there are uncommon experiences like a moment by moment experiences which we get by looking at the design of the product, and by the aesthetics of interaction and historical or temporal experiences which are the experiences that are stored in our memories. Historical/ temporal experiences are more practical than a moment by moment experience in practice. Because the experiences we had in the past are in our memories (historical/ temporal) that help us to design a story about the usage and consumption of that product or service.

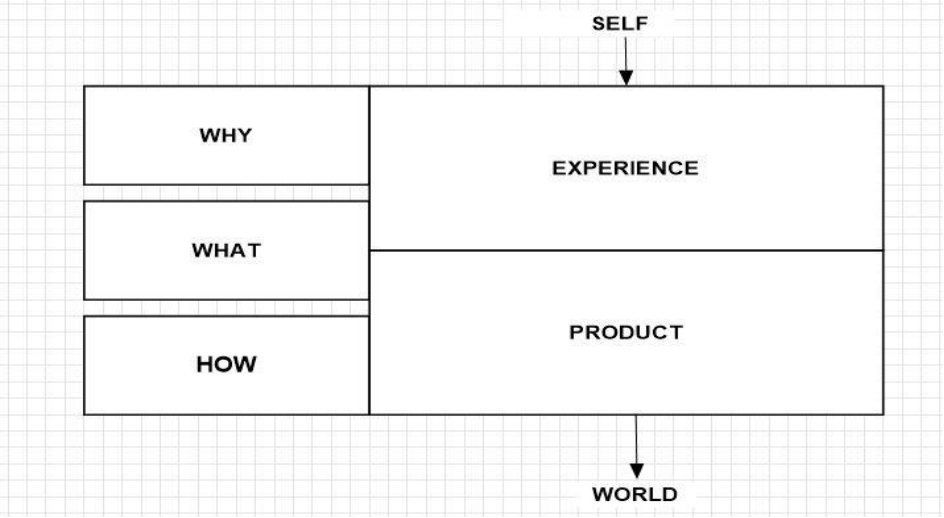
2.2 User Experience Design

Today the technology has ruled all over the world, so the growth in the number of mobile and web applications has been remarkable. As there are tough competitions in the business markets, it compels the designers to search for a new and special way to make their products different from others as most of the deliverables are comparable to their quality, features and user-friendliness. According to Dandavate et al. (1996), most designers and product researchers still cannot find the reason for the popularity of some products and a close connection to the peoples' lives. The authors have found it as a mystery. So, they have proposed to the researchers and practitioners involved in product development teams gathered to improve their skills to identify the feelings of the users about their ownership and usage of the product. They have found out it is not the design that is based on rationale cognitive models that make the user closer to the product. It is their emotions that make them closer to the product as their emotional level creates their comfort, satisfaction, and awareness about the product. As a result, they have concluded that the success of the product depends on the empathizing skill of designers with the users, from the beginning of the product development process.

Likewise, according to Bevan (2008), to understand the users' needs and improve the product or service for providing better user experience, we assess usability while developing the product or service. We can assess UX and usability in various ways but the primary goal of assessing usability is to make sure from the users' point of view, that they gain effectiveness, efficiency, and satisfaction from the product/service. And we measure UX by the users' satisfaction with the product or service when they gain pleasure, pragmatic and hedonic goals fulfilled. The definition of effectiveness is the accurateness and entirety with which the identified users can achieve identified objectives in particular surroundings. The definition of efficiency is the resources consumed to the accurateness and entirety of objectives accomplished. And the definition of satisfaction is the ease and suitability of the work system to its users and other people influenced through its utilization (ISO 9241-11, 2010).

Literature shows that pragmatic qualities of software products are "supporting", "clear", "useful", and "controllable" (Hassenzahl, 2003, p.5). A pragmatic product's major goal is to satisfy all functions that could be anticipated from the combination of those qualities, according to the author, the pragmatic product is instrumental. Hassenzahl (2003) has considered the rest of the product's qualities as hedonic. He has selected the term 'hedonic' to emphasize the variations of these two qualities of the product. The hedonic qualities of the product are "impressive"," outstanding"," exciting", and "interesting" (Hassenzahl, 2003, p.6). The key difference between them is that hedonic qualities highlight individuals' psychological well-being, whereas pragmatic qualities highlight an individuals' behavioral goals. Therefore, according to Hassenzahl, hedonic qualities are tougher than pragmatic qualities. But to make a successful product, we need to develop both qualities in the best way to build a strong relationship between the user and the product. The author has also argued about the combination of these two qualities of the product and displayed various types of characteristics of the product constructed on these combinations. It provides an unobstructed view of the qualities and characteristics of the product.

Figure 1.1: User Experience Design (Hassenzahl , 2013)



Hassenzahl (2013) has also suggested that when designing an experience through an interaction with the product, we need to think about three levels, and they are why, what, and how. First, 'why' explains the necessity and sentiments of a person in an activity or experience or why he or she wants to use that product. Second, 'what' explains the action of a person, he or she can perform through an interactive product, and last, 'how' explains what kind of method a person applies to complete the action through a product. Thus, user experience design (UXD) is the procedure used by designers to build the product that offers significant experiences to the users. In this process, they put their users at the heart of the development process. So, we can see that there is a powerful connection between users and the product. Thus, the designed product needs to be evaluated to achieve the top satisfaction level of experiences and the certain goals of the product.

2.2.1 Evaluation process in User experience Design

In the article by McNamara & Kirakowski (2006), the authors have proposed that there are three major aspects of using a product that needs to be considered and they are usability, functionality, and experience while designing and testing the technology. The authors have made an argument that, among three aspects, the practical issue that is connected to the product is functionality. So, the evaluation focuses on finding out what the product does. This can address the issues with the usefulness of features of the device, maintainability, and reliability. Thus, the interaction between the user and the produce is measured by usability. Since the product solves the problem of users so, we test the product with the actual user. So, usability tries to provide the opportunity for users to examine whether the product performs exactly what they wanted from it. Last, user experience reflects the relationship between the user and the product to explore the fact that whether the product fits with the users' character. The questions might contain about the thought of the person, about the experience with the product, what it meant to that person, whether it was essential to that person, and whether it met with that person's values and goals (McCarthy & Wright, 2004, McCarthy & Wright, 2005).

To measure and evaluate each of the aspects, several things need to be considered when carrying out the assessment. The authors have provided some instructions for these aspects:

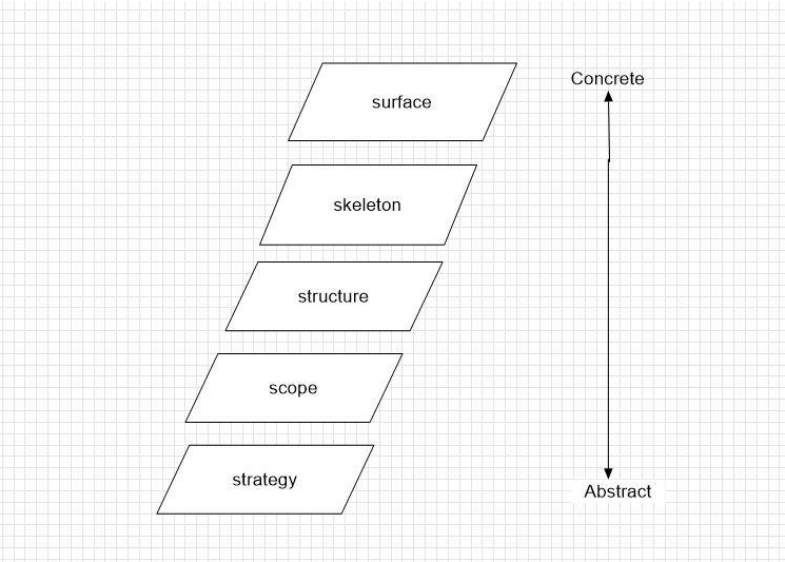
- **Assessing Functionality:** This contains the features of the product along with reliability, durability, and evaluating the performance of a product. The user comments can be an efficient tool to check whether the functions of the product are presented as close to the users' expectations or not.
- **Assessing Usability**: In usability, user's comments deliver the possibility to test the ease of use, transparency, learnability, and the suggested steps of usage, guides, manuals, and the availability of the related services around it.
- **Assessing Experiences**: Since experience is quite an unfamiliar area in the HCI, there is no certain fully developed evaluation methods in user experience, some designers have used usability methods and have added more human elements to it so they can evaluate the UX values.

Further, Bevan (2008) has mentioned that the UX or usability of a product or service can be evaluated in two types, one by evaluating the result of usage of the complete system and the other is testing the quality of the user interface. The first one is, the usability of the entire system is measured by effectiveness, efficiency, and satisfaction, and we measure these in terms of quality in use according to the viewpoints of different stakeholders. Literature shows that to the stakeholders of any company, the quality and usability in use means getting the job done successfully while for the users, effectiveness and efficiency are 'do' goals (pragmatic) and 'be' goals (hedonic) for them are an inspiration, recognition, recreation, and pleasure. And second is, the features of the user interface are used to measure the quality of any user interface that means a good user interface design makes the product or service easy to use. Therefore, though there are various evaluation techniques, the major aim of doing the evaluating task is to gain top satisfaction levels from the users from the usage of a certain product.

2.2.2 Elements of User Experience Design

According to Garrett (2010), there are five planes of user experience design projects such as "surface", "skeleton", "structure", "scope", and "strategy". Surface contains a sequence of webpages, created of images and text. The skeleton of the website is below the surface. The skeleton is a proper look of the further abstract structure of the site. In this skeleton, the location of buttons, controls, block of texts, and photos are prepared. The major task of the skeleton is to arrange all elements and provide them the finest space and conduct to perform efficiently and logically. Structure's concern is to define how users interact with the product by explaining how users got to that page and where they should go after they complete their job on that specific page. Each website has a strategy behind it, the strategy defines the scope of that specific website and creates limitations for the potential list of functions of the website (Garrett, 2010, p.22).

Figure 1.2: Five Planes In User Experience Design(Garrett, 2010, p.22)



According to the literature, as the skeleton plane determines the visual representation, presentation, and arrangement of all the elements, it has more capability to increase the efficiency and effect of the website.

- **Skeleton Plane**

Garrett (2010, p.108) has categorized each plane into two parts such as the first part is a product as functionality, and the second part is a product as information. The author has defined the skeleton through interface design and navigation design in the functionality part, and for the information part, the author has defined the skeleton through information design. We make interface design to present and arrange interface elements to support users to interact with the functionality of the system. Navigation design is a particular form of interface design that tells the users how to navigate through the information using the interface. And the information design defines the information presented in a way that eases understanding to make effective communication.

- **Wireframe**

When interface, navigation, and information need to be designed then the concept of page layout arises to develop a combined skeleton for a website. Garrett (2010) has stated that the page layout should include all the diverse navigation systems, each designed to deliver a special view of the architecture and all the interface elements are essential as they have an important role in the page. Based on the literature, we can describe wireframes as a graphic way to produce the skeleton of the website, that shows all the components of the page and how they fit together to be in contact with the user. Wireframes collect all the ideas in a single document that is a reference for implementing visual design (Garrett, 2010, p.128). So, a wireframe is a basic blueprint that shows the key structure and function on a single screen of a webpage or an application (Hamm, 2014, p.32). Thus, wireframes are the essential first stage in a proper visual design for a web project and during the entire process of development, the developers should visit to compare the

product with what has been pointed out in the wireframe. Not only in the skeleton, those who are responsible for other planes such as strategy, scope, and structure can also refer to the wireframe to check that the final product can meet their expectations. Besides this, people who are accountable to build the website can also refer to the wireframe to get the answers about developing the functions of that site and also to check if they are making progress or not (Garrett, 2010, p.130).

According to Garrett when we have independent user experience designers and visual designers, working collaboratively then they can produce successful wireframes. When they work together, then there is a sharing of their ideas on the topic, they are experts in and providing feedback to each other. This will help them resolve the problem during the designing process. Despite this, they will also explore hidden problems as well (Garrett, 2010, p.130). Given these points, it seems wireframe is playing an important role in the user experience design process for all those people who are involved in any web projects.

2.3 Empathy

The concept of empathy was first invented in 1873 in art history from the German word 'Einfühlung' which means feeling oneself into. Robert Vischer has used this term to define a procedure where a lady launches her complete character upon an item, and it combines with that item. Edward B. officially translated this German word in 1909 to the English term 'empathy' (Titchener, 2014). Today different fields such as philosophy, social, and behavioral sciences frequently use this term 'empathy'. Empathy comprises indirect experience or reflection of another individual's emotions. When we feel some parts that another person is feeling then that is empathizing with that other person. In a scientific term, empathy is a complex concept that comprises emotion, acknowledgment, and secondary feeling. It is a kind of essential emotional skill in a social context. To improve empathy, several programs are designed as communication skills in the teaching sector for professors, doctors, and public workers and also for lowering the mental health issues, crimes, and biases in the society (Peters and Calvo, 2014).

The Cambridge Dictionary of Philosophy (2000) has offered three important meanings to the term 'empathy'. The first meaning of empathy is that it reflects an automated replication of expressions or display of feelings. The second meaning is it might also imply replication of look that means the transmission of consideration from other's reactions to its cause. And the third meaning is it signifies a character portraying that recreates in the creativeness factors of other's circumstances as the other recognizes it. Therefore, empathy is an inventive prediction of another individual's condition. According to Koskinen et al. (2003, p.46), empathy represents an effort to get hold of its sentimental and encouragement traits. The knowledge of empathy helps designers to step ahead to have a closer look at the users' lives and experiences to be certain that products/services are designed to their needs and desires.

Many researchers have found that empathy is a key concept that contains other related concepts such as emotional transmission, sympathy, and compassion (Batson et al., 1987). According to Eisenberg et al. (1991, p.63), the concept of empathy, sympathy, and cognitive processes often are included in various theories and models of social and moral development. The capacity to understand another person's feelings is a cognitive process that includes role-taking or impersonating, direct connection, or behavioral intention, labeling, detailed interaction whereas the emotional process is concerned with sympathy, empathy, and individual suffering. This is the reason there is always a discussion regarding the definition and nature of the empathy and the

relation between empathy to other cognitive processes. Thus, according to the authors, the better way to understand the concept of empathy is to compare and study the differences in how empathy is taken into consideration in a current basic understanding.

Besides, Wispé (1987) has stated that for normal people, the term 'empathy' and the associated term with it like 'sympathy' makes similar meaning but when scientists make a conversation about empathy, they differentiate between empathy and sympathy. Sympathy is defined as a state of consciousness of another person, but there is no need for concern for that person. This definition shows an obvious distinction with the general view on empathy. But this does not mean that all the scientists have similar views on empathy as it differs according to its particular nature of the consciousness. This means that the opinion of the scientists matters based on their knowledge and expertise. The authors have categorized two groups of the scientists who have original opinions on empathy based on their knowledge such as the first group are for those scientists who are related to the social and development and the second group are those associated with psychology and counseling. For the first category, they consider empathy as a state or talent to identify and feel the emotion of others, while for the second category, they consider empathy as a state of noticing or talent to notice, the state or circumstance. So, according to the author, most of the scientists from the social and development field describe empathy as a state or talent both, of identifying and sharing another person's emotion whereas most psychologists describe empathy only as a state or capacity of identifying or considering the mental condition of others.

In the same way, Wright & McCarthy (2008) have also stated that from the viewpoint of a pragmatic approach, understanding or knowing the users in their lives includes the understanding of that feeling to be like that person, understanding of their circumstances from that persons' view. We can see that this approach contains empathy. A social theory mostly considers empathy either in two ways, the first approach views empathy as identifying, understanding, and feeling the sentiments of others which directly points out the psychological manner and personal competences. This is the emotional correspondence between people as one person can identify the feelings of another person because of their common humankind. And the second approach perceives empathy as an intersubjective achievement. This intersubjective or sociocultural approach focuses on the circumstantial differences between self and others and highlights the method of expressing the other's scenario with one being specific.

2.4 Empathic Design

According to Rogers (1975)**,** being empathic is the state of existing with other individuals. This shows moving into the personal emotional space of another individual. This includes being delicate, having mixed feelings of anxiety, anger, or misperception of what another person is undergoing. It means for the time being staying in another person's life making no verdicts and get to know the experiences that a person is feeling. While putting ourselves in others' situations we should leave our opinions and ethics to be fair enough to be in that situation and we should know those feelings that a person does not want to expose because of his or her innocence. The author has said that the person who is empathizing with another person facing a certain situation needs to be tough however he or she also needs to be sensitive to understand the person suffering and the situation. Similarly, Kaasinen et al. (2015) have also stated that one of the most important parts of design is knowing the perception and societal circumstance of the user. Throughout the design process, if we give empathy an extra consideration then there is a chance of reducing the costs, designing of unachievable products, and not meeting deadline time. Thus, the strategies of empathy have become essential features in the designing process, and empathy

is also frequently suggested as one of the fundamental skills of the designer. The author who invented the term “empathic design” was Dorothy Leonard as he was among the writers who wrote about the well-built relationship between design and empathy (Sleeswijk Visser et al., 2007).

Correspondingly, Leonard and Rayport (1997) have mentioned in their literature that for any company to run successfully, the product or service they constructed has to fulfill customers’ actual desires, and to do this the company needs to find these desires that customers themselves are now not aware of. So, it was a challenge for the designers to know about the customers’ actual needs without being told to them. Normally companies request customers to take part in workshops, surveys, usability tests in the workrooms to assist in the development of their new products and services. But doing this will help the company only to gain the information that is already known by the customers since they can be familiar or experienced with some requirements of the product and services. So, to gain such information about the hidden needs beyond the knowledge or awareness of the customers, companies need to apply the empathic design. Thus, the empathic design supports companies to improve the product and service by observing the customer using products and services in the setting of their specific surroundings. Leonard & Rayport (1997) have identified the five key steps in empathic design: observation, capturing data, analyzing data, brainstorming for solutions, and developing prototypes of possible solutions. So, the methods of the empathic design include collecting, examining, and using materials gathered from observation in the practice and to work with these methods there is a need for an extraordinary collective quality that is not common in every company as the empathic design requires innovative communications between the cross-functional group. Sometimes customers are so comfortable with the present condition that they do not feel to request a new answer, yet they have actual desires that can be referred to. Because of this reason, researchers cannot identify the actual needs of the customers (Leonard and Rayport, 1997).

Thus, empathic design is a user-centered design approach that focuses on users’ emotions and helps the design teams to construct an innovative perception of the users’ experiences for the development of new products (Koskinen et al., 2003). In the literature by Postma et al., (2012), the authors have shared their personal experiences of applying empathic design in various new product development projects. In their opinion, though they have been successful in their job using empathic design, but they have also encountered several obstacles during the development process and they have found vast differences between the theories in the texts and working by following those texts in practices. They have suggested three cultural and methodological methods that refer to these challenges in the upcoming days. Some changes they have mentioned are giving more focus on the empathic methods than rational ones, changing the role of the users from respondent to collaborator, and from the receiver of information of user research to the involvement of the user himself or herself in the user research.

To carry out the design projects with the empathy, Kouprie and Visser (2009) have suggested a complete framework to apply empathy in design. This framework provides a vision to the designers about their role with their own experiences at the time when they empathize with their users. The suggested framework in the article shows the four phases and they are discovery, immersion, connection, and detachment. In the discovery phase designers contact users by meeting them personally or by doing user studies with the help of questionnaires to find out their experiences and state of their lives. After this phase, designers make a move to be closer to users by entering the users’ world to observe and study more about their users having no conclusions.

This phase is called immersion, and, in this phase, the designers must be broad-minded, and their focus should be on users' viewpoints. After that, there is a phase called connection in which the designers need to recollect users' views logically so that both of them can recognize the emotions and significance of a particular matter. This phase supports the designers to connect emotionally with their users. And in the last phase, detachment, the designers get separated from their users' lives and they return to their primary role as a designer and begin ideation since they already have lifted their level of understanding about the user's lives. The authors mentioned that in all these phases, the designers' focus is only on their users in every feature.

2.5 Human-Computer Interaction (HCI)

The term "HCI" has solely been in global use since the early 1980s, and it has its foundation in various well-known fields. The principal goal of conducting HCI research has always been the growth of quality measures for interactive products. As a field of research, HCI is taken as an essential concern in the areas of computer science and system design. HCI is a field of study that deals with human (user), computer (technology), and interaction (communication). When we mention user, we would mean a solo user, a group of users working together, and a categorization of users within the company where each of them have to make contributions to accomplish the task. A user can be anyone who is attempting to complete the work through the help of technology. When we mention a computer, we would mean any technology that may vary from a simple desktop computer to an extensive computer system. And when we mention interaction, HCI tries to make sure that both human and computer makes a successful communication. To make a product successful, three 'use' words that must all be correct. The first one is 'useful' so the product must achieve what is expected, the second one is 'usable' so the product must perform effortlessly and sincerely with no possibility of mistakes and the last one is 'used' which means the product must be attractive, appealing, exciting, etc. to be used by people (Alan et al., 2004, p.3 - 4). Thus, HCI is a cross-disciplinary domain which studies how interactive systems must be designed and developed to be effective, beneficial, pleasing, and also appealing to the users (Preece, J., Rogers, Y., & Sharp, 2007).

In HCI the focus of the authors was on the knowledge of effect technology has on how people think, feel, and communicate and apply this knowledge to information design technology. Philosophically, now HCI focuses on the experiences, felt life, feelings, needs, satisfaction, and more common philosophical behaviors, attempts, and tasks. In this setting, empathy has appeared as an essential thought with realistic results for HCI (Wright & McCarthy, 2008). As we know that the users are the ones for whom the computer systems are designed thus their needs must be every designer's importance. So, to get an idea of the one for whom we are designing, then the first thing we have to do is to understand their skills and weaknesses. This will help us know what they find convenient and the way we can inspire them. For this purpose, our job is to observe their features of cognitive psychology such as the way of observation of the world around them by users, the way they collect and practice information, the way they solve the difficulties, and the way they physically operate the things. The authors have stated that there are three important factors of the computer system like input-output, memory, and processing. And in terms of humans (users), there are many factors that influence human information processing systems like vision, hearing, touch, movement, memory, etc. and some external aspects also such as social and organizational backgrounds (Alan et al., 2004, p.12).

Alan et al. (2004, p.51) have also mentioned that besides human perception and cognitive capabilities, human emotions also have a significant role in the performance of them in a certain situation. For instance, the positive feelings make us more creative while dealing with the obstacles whereas the negative feelings make our thinking capacity restricted. So, when we are in a pleasant mood, we can solve the problem easily, but when our mind is not in a pleasant state, then an easy problem also turns into a tough one. However, according to Wright & McCarthy (2008), there are unconventional design approaches that have been developed to focus on unique aspects like aesthetics of interaction, hedonics, affective processing, etc. These aspects direct to the specific features and circumstances of experiences supportive in the design process. To understand the users and their experiences, various approaches based on narrative, life history, enact have also been introduced and used. So, to define the relationship between the designer and user, empathy has been used when there is an involvement of user experience in design. HCI has created several qualitative methods for obtaining experiences and creating descriptions of those so we can use them in the design process. Those descriptions contain narrative and life story methods such as personae, scenarios, and probes. We can see that now HCI is much focused on the experiences, felt life, needs, desires, and much more on common ontology actions, habits, and responsibilities. Also, Battarbee & Koskinen (2005) have identified three major methods for utilizing and explaining user experience in HCI which are the measuring approach, the empathic approach, and the pragmatic approach which we have discussed above in the 'Empathy' section. Thus, empathy plays an important role in the designing process when we have to design while putting consideration on user experiences, relationships between designers, users, and objects.

2.6 Human Centered Design

According to IDEO. org (2015), HCD is an invention motivated by individuals. HCD knocks into our innovative traits that are usually yet ignored by more traditional problem-solving habits. So, it is a process that is encouraged by performances rather than population, occurs in a normal setting rather than organized setting, trusts on lively dialogues than written interviews. Eventually, HCD is a process that supports the design teams to convert tough encounters into suitable solutions. In this paper, they have defined HCI as unique concepts like HCD is empathic since it starts from an extreme understanding of the desires and inspirations of the people that makes a society. Similarly, HCD is collaborative as in HCD, there is a sharing of views and ideas between the teams which helps in creating a greater solution. HCD is optimistic as it is a faith that asks for the change no matter the problem is big, or time is little. It is not concerned about the restrictions around that environment as the designers believe that design is a powerful process. And finally, HCD is experimental as it is more about testing and studying by doing. It gives the assurance to the designers that there is always a chance for better and unique things and that can turn into reality.

Similarly, according to (IDEO, 2014), in the human-centered design, there are three stages such as inspiration, ideation, and implementation, and these stages are used to develop empathy with the people for whom designing is carried out and to find out the way to turn the knowledge of designers into design solutions and to test the ideas made by them before presenting to the client. In the inspiration stage, designers can study a better way to understand their users through observation of their lives, listening to their requirements, and being intelligent when there are obstacles in the designing process. In the ideation stage, designers can generate several ideas from the things they have heard from their users and distinguish the opportunities for design, test, and improve their solutions. And in the implementation stage, designers can bring their solutions

to lives. They also present their ideas to the market and also a way to expand the influence of those ideas. To perform the HCD process, designers can use several tools such as to develop empathy with the users, designers can interview, to keep the ideas generative and clear, designers build prototypes of their ideas, and to uphold strength and creativeness designers must work in teams.

In the article by Tidball et al. (2010), the authors have mentioned that the wide use and the popularity of Human-Computer Interaction (HCI) has raised the development and improvement of the HCI related tools and methods. Because of the huge number of choices, particularly trainees and students are having a hard time finding and using suitable tools. So, they have shared their ideas by explaining the major resemblances and dissimilarities of those tools to refine the HCI in academics and in practice. Ideo (2011) developed Human-Centered Toolkit, which is a combined work between IDE and IDEO. This booklet, in its introduction, has proposed three segments in human-centered projects such as hear, create, and deliver. Each of these three segments is arranged in the same manner and offers the same kind and intensity of information that leads a reader through the HCD procedure. They have also presented some steps and methods for each segment. In the 'hear' segment the designers gather the stories and motivations from people. In the 'create' segment the designers would work together in a team to transform the information that is collected from the hear segment to methods, prototypes, prospects, and solutions. They have mentioned that this 'create' segment has two methods. The first method is the participatory co-design, and the other is the empathic design. According to the authors, the empathic design should not be performed only for producing ideas, but it should be done by keeping the user in our mind throughout the entire process. And in the 'deliver' segment, designers present their solutions to the world. In the booklet, the authors have mainly focused on the importance of empathic design and have also applied this design process in their HCD projects.

2.7 Participatory Design

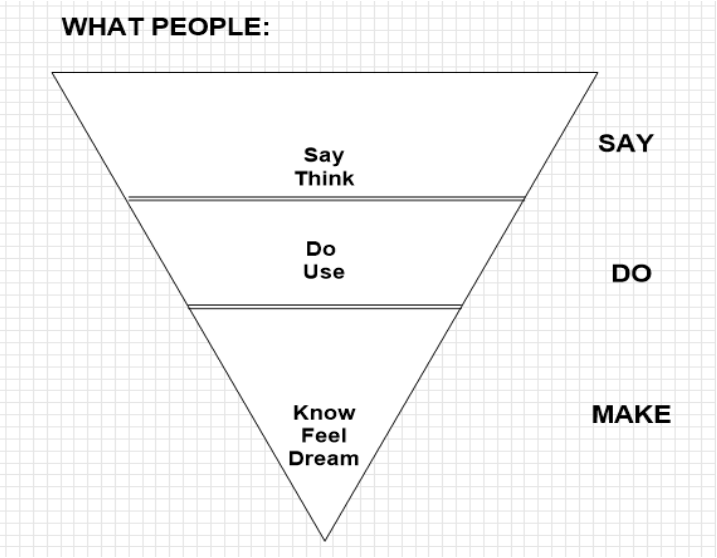
According to B.-N.Sanders (2002), in the user-centered design process the focus is the user and goal is to ensure that the designed product meets the needs of the user. The researcher gathers the information about the needs of the user and then provides it to the designer, and the designer draws this information in the form of sketches or scenarios for the further development process. So, in the user-centered process, the role of the researcher and the designer is different, but still they depend on each other. And the user is not the actual part of the team as the researcher speaks on behalf of the user. By the time, there was a change in the thinking in the designing process which developed the concept of participatory design. In this design process, there is a rapid change in the user's role. The roles of the researcher and the designer were not that important as the role of the user since the user became the key factor of the process. Individuals expressed themselves and wanted to take part directly and actively in the development process.

It is also believed that it is difficult to design experience because experience is a stepwise innovative event produced by the users. A user's experience has two aspects, communicator, and communication, it is foremost to see the interaction of these two in a specific moment. The main query is how this communication is figured out and how they are collected in a previous conversation, that can produce positive influences during the design process to design a significant experience. To answer this query, we should know the ways to access experience (B.-N.Sanders, 2002).

How to access experience?

B.-N. Sanders (2002) has suggested a few ways to study memories, their current experience, and their desired experience from the users. Based on the literature, designers can listen to what individuals say and grab what they think. Besides this, a designer can also watch what people do and observe how they use the product and what they think about a situation.

Figure 2.7: Ways we can learn (B.-Sanders, 2002)



The literature shows that the several ways of accessing experience have developed. The traditional design research methods were emphasized in the research based on the observation. In contrast, traditional market research methods have been emphasizing what people say and think, by the means of interviews, questionnaires, and focus groups. So, when these three viewpoints (say, do, and make) are studied together, then the person can quickly understand and build empathy with the user using the product or the service. The recent development in design research is 'the make tools'. Sanders thinks designers should provide 'the make tools' to ease the conversation between the users and the designers. Since this is being used by the users to show their creativity it should not contain any complex features and should be easy to use. So, this shows the significance of using 'the make tools' in the participatory design process to include the participant's ideas and let them say, do, and make (B.-N.Sanders, 2002).

2.8 Design Thinking

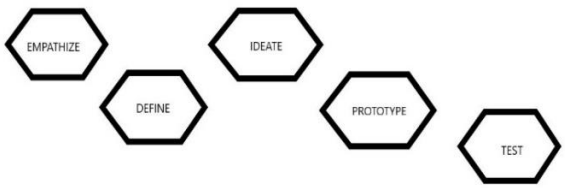
Design thinking has gained more attention in the commercial market as the design of the products and services has become a key element of business competitiveness (Dunne & Martin, 2006). According to Brown (2008), traditionally, the design has been considered as a downward step in the development process where there was no important role of designers in the major work of creativity; their job was to place a nice cover around an idea. This method has stirred market rise in many areas through creating new products and technologies visually beautiful, and more pleasing to the customers or by improving branding view through intelligent, suggestive advertisement and communication plans. During the second half of twentieth-century design grew to become a progressively treasured competitive strength. Now designers' job is not to make an already developed idea nicer, but their companies ask them to build ideas so they can achieve the customers' needs and desires. In the author's opinion, it is unnecessary that all design thinkers

are made by only design institutions, though most of the experts have received some design training. But it is possible that the people not from the design field can also have a natural skill for design thinking. There are some features that can make anyone looks like a design thinker like empathy, optimistic, inclusive thinking, experimentalism, and teamwork (Brown, 2008).

Ambrose & Harris (2009) have identified that there are seven stages in the design process such as to define, research, ideate, prototype, select, implement, and learn. In the first stage, which is 'define', it defines the design problem and the target audience. This stage helps the designers to have a detailed understanding of problems that leads to the creation of more precise solutions which will help in making the project successful. The second stage is 'research' where designers analyze information like the description of the design problem, user research, interviews and finds difficulties. The third stage is 'ideate' where users' needs and desires get recognized and then ideas are generated and those ideas are met, possibly through interviews. In the fourth stage which is prototyping that helps the designers to present their ideas to the users or stakeholders visually to receive their feedback for making improvements if needed. The fifth stage is the selection that helps the designers to understand the suggested solutions that are reviewed, compared to the design brief objectives. All the solutions that are proposed cannot be satisfactory, though some of them can be practical. In the sixth stage which is an implementation where the design is developed, and designers deliver the final deliverables to the customer. And in the last stage, which is learning, that helps the designers to improve their performance. For this purpose, they should get feedback from their target audience and decide if their solutions met the design requirements. This stage is also helpful to the designers as in this stage they can recognize the progress that can be made.

In the article Stanford University (2016) by Hasso Plattner, design thinking is the user-oriented way of solving real-life problems focusing on users' needs and their requirements. The author has further explained, instead of solving the problem technically, in design thinking, users' needs and problems, and users themselves are explored and addressed. So, design thinking is applied in many business organizations as a problem-solving method. Plattner has proposed five different stages of the design thinking process model and they are Empathize, Define, Ideate, Prototype, and Test. These stages do not require any precise order as they can be repeated iteratively, or they can show up in parallel.

Figure 2.8: Design Thinking Process (Plattner, 2016)



i. Empathize:

In this stage, the foremost goal of designers is to understand the problem they are trying to solve where they must understand the users and their needs, wants, and objectives. Besides these the designers must try to understand the users' way of doing things, the reason they are doing those things, their physical and emotional needs, their thoughts about the world, and the things

significant to them. Plattner has mentioned that as a design thinker, the issues they are attempting to resolve are hardly their own, the issues are those of certain groups of people. To design for them, designers need to get empathy for who the users are and what is essential to them. In this stage, close observation of users and their behavior in their surroundings give an obstructed view of their thoughts and emotions. This will make the designers' job much easier to identify their users' needs.

The article by Stanford University (2016), defines that while watching the people, the designers can secure the physical hazard of their users' experiences like their behavior and the phrases they have spoken. The understanding of these things can provide the designers with a better way to produce creative solutions. When the designers have the best understanding of their users' behavior, then there is a greater chance of an invention of the best solutions for those corresponding problems. To have a close observation with their users, the designers must connect with their users directly by having a pleasant conversation. And while having a pleasant conversation, there can be exposure to the unexpected ideas as the stories that people speak and they perform can differ from what they truly perform. Thus, designers can make an excellent design when they have a strong understanding of their users' beliefs and morals. Therefore, the author has stated that to empathize the designers should watch users and their actions in their lives. This can only be possible through involving the user in such a way that they can open themselves about their thoughts and feelings easily. So, when there is an interview session, the primary job of designers is to make their users feel comfortable having a delightful conversation. For this purpose, the designers must prepare some questions beforehand, but their conversation must not be limited to those questions. The designers can make their conversation long by listening to the stories of their users and by raising the question to them by asking the reason for those stories so that the designers can discover the hidden meaning behind those stories.

ii. Define:

In this stage, all the information that is collected in the Empathize stage is categorized and analyzed to figure out the core problem that has been identified. So, this is the stage where designers share their information with others not to miss any crucial parts. They use unconventional methods to pour all the information they have gathered in a visual form trying to build relations by using pictures of users, post-its with quotes, journey maps or experience maps, etc. So, according to Plattner (2016), the principal aim of this stage is to create a relevant and useful problem statement which is the designers' point of view. This problem statement is a guiding statement for the designers that mainly emphasizes on perceptions and requirements of a particular user. Thus, this stage helps designers to collect amazing ideas to create features, functionality and other factors that help to solve the problems that have been recognized.

iii. Ideate:

According to Plattner (2016), this is the stage where designers generate ideas as they already understand their users, their needs which end up with a creation of a problem statement. The designers should ideate to shift from the job of finding problems to the job of making solutions for the users. Ideation offers the designers all the source materials that they need for constructing prototypes so they can make a creative solution. This stage also provides significant help to the designers as they can bring together their understanding of the problems and the people they are designing for, with their own thoughts to produce the best solution. So, here in this stage, the designers try to identify the solution for the problem that has been created before. And for this

purpose, they can use any method from several ideation methods such as brainstorming, sketching, and mind mapping. The basic thing in this stage is that the designers must generate ideas, making no evaluations on their own.

iv. Prototype:

We create a prototype to test the solution found on the ideate stage, which also helps the designers to provide the basis for comparison at the selection stage (Ambrose & Harris, 2010). In this stage, a distinct product or feature is created to match the user-desired solution. A prototype can be anything where a user can communicate with, which can be post-it notes on a wall, a device, or even a storyboard. We need it not only for the communication purpose but also for the original purposes such as to generate ideas and solve the problem; to begin a conversation with the users or stakeholders; to test the potentials; to invest less cost and time, etc. Thus, the designers must make a prototype, with the users in their mind that answer a certain question when tested (Plattner, 2016). We can create a prototype wherever it is easy to present to our users where they can interact with our product.

v. Test:

Plattner (2016) has mentioned that testing is a chance to study the user and the solution to the problem. This is the stage where the designers ask or request comments from the users about the prototype they have designed for their users. This is also an opportunity for the designers to achieve empathy for the user whom they are designing for. The best question to ask the users is not about their likes or dislikes of the prototype but the reason for their likes or dislikes. This could help the designers to pay more attention to study about their users, the problems, and the potential solutions. In brief, this is the stage where designers know much about their users. We perform testing to improve prototypes and solutions, to gain more information about the users, and to improve the perspectives or opinions. So, we keep on improving our solutions unless our users find it satisfactory or according to their desires. By doing this we will be successful to get a suitable solution as our users' wish.

When we have a better knowledge of good design thinking, then it helps us to solve the complicated problems and unexpected mistakes (Razzouk & Shute, 2012). In design thinking, we will try to understand the problem, the one who is facing the problem, try to find the solution for them, and test the solution, following the procedure we will be clear who are our users, what they want and how can we give them a solution. Thus, the design thinking process is implemented in all kinds of projects.

2.9 Conclusion

The literature review presents that in user experience design, involving the user during the entire procedure of the designing process, maximizes the opportunity to achieve the specific goal from the specific product. Mainly in web projects, designing the skeleton plays a vital role in the goal's achievement of that project because it describes the conceptual structure of the website that needs to be designed and also allows presenting important information. During the wireframe design process, the most popular tool used by designers to design a website skeleton is a wireframe. In the empathic design, it involves users and stakeholders intensely with a design project that supports designers to be more aware of our stakeholders. The designers are compelled to explore the skills that can build a close connection with their users and watch how they feel and think and how they get ideas and how they behave with the designed product. Thus,

an empathic framework is essential to apply empathy in the user experience design process, and based on the literature, among the four phases, the connection phase is the one where users can take part in the wireframe process. There are many qualitative methods in HCI for obtaining experiences and creating descriptions, so we can use those descriptions of experiences as the valuable information in the designing process. In HCD, based on the literature, inspiration, ideation, and implementation are the three important phases to build empathy for the people for whom we are designing for. The study shows that participatory design is a beneficial method to be used in the user study. The study claims that participatory design is an effective way to observe the people what they say, do, and make. Design thinking is used to solve the real-life problems of users' that emphasize on the users' needs, so it is applied in several organizations as a problem-solving method.

Chapter III: Methodology

This chapter introduces methods used in the proposed research. This chapter delivers an overview of how the research has been conducted and what choices I have made during the process. This chapter focuses on how data has been collected, and these are presented through a description of case selection, data collection and data analysis. The information about participants and their role in a user experience design is also introduced. And these participants are the manager and the staff of the Kebabish ApS. Then the process and methods of data collection are presented.

3.1 Research approach

The research approach is the selection of the methods in collecting, analyzing, and interpreting the collected data from various sources. We can research through two main approaches such as quantitative and qualitative approaches. We can understand the quantitative research approach as a research strategy that highlights quantification in the collections and analysis of data. In contrast, we can understand the qualitative research approach as a research strategy that normally highlights words rather than quantification in the collections and analysis of data (Bryman, 2012, p.36). These two approaches may differ according to the uncommon situations depending on the research and the research questions to be answered. These approaches are useful to describe, explain, or interpret the data. The qualitative approach is usually related to small-scale studies, containing a holistic perspective. It means that the quantitative research approach focuses on analyzing certain variables whereas qualitative research believes that realities in society are entireties that cannot be separated from their context nor they can be split for a single study of their distinct parts'. The qualitative research approach is also related to data analysis during the data collection phase whereas, in quantitative research, the process of analysis is separated from the data collection process (Denscombe, 2014, p.246).

Since the principal purpose of our study is to find out how important is empathy in the designing process and the answers to our research questions. So, to provide the answers to our research questions, we have used different sources of data such as semi-structured interviews, answers to open-ended questions, and online card sorting methods (Denscombe, 2014, p.277). Thus, these sources of data show richness and detail to the data as it involves an in-depth study of related emphasized areas and also, it deals with the complicated circumstances of the society. The findings from this qualitative approach are built upon the proof from the context of an actual

world. This approach has the potential of over one explanation being effective and can also bear uncertainties and inconsistences (Denscombe, 2014, p.302).

It might be problematic to generalize the findings as qualitative research depends on the detailed study of a few cases. Since qualitative data are unstructured when they are first collected in their 'raw' state, and then they must be coded before analyzing that data. So, this approach takes a long time to analyze the data. As we know that there are researchers' involvement in this approach, this gives them a space for their identities, background, and beliefs so they can raise questions regarding the objective of the findings (Denscombe, 2014, p.302). Even though there are some disadvantages of qualitative research, it is more appropriate than a quantitative approach as it gives a better understanding of the subject and helps to discover new thoughts and individual views.

3.2 Research Design:

A general plan or choice made to answer the research questions is called research design. It provides a framework for the collection and analysis of the data (Bryman, 2012, p.50). This research design discusses five distinct types such as experimental design; cross-sectional design or survey design; longitudinal design; case study design; and comparative design. Experimental design aims to be strong in internal validity and is applied in the areas of inquiry such as social psychology and organization studies. Likewise, a cross-sectional design also called a survey design enables researchers to collect data on over one case at a single time to gain qualitative or quantitative data. Unlike experimental design, this design always lacks the internal validity. With this design, it is possible to test the relationship only between variables. And these variables are later on tested to discover a pattern of associations (Bryman, 2012, p.59). Normally, this survey design is related to the collection of data through questionnaires and structured interviews. Similarly, longitudinal design is not frequently used in social research as it consumes more time and implement cost of this design is high. So, this design is usually used to plan the changes in the business and management research. And to identify these changes, this design needs the research to be made more than once (Bryman, 2012, p.63). In the case study design, the detailed and intensive analysis of a single case is done. The case study design is common and broadly used in business research and it includes the cases of a single organization, a single location, a person, or a single event(Bryman, 2012, p.66). Be sides, comparative design studies two or more contrasting cases or situations applying more or less equal methods. This design might be recognized in the setting of either qualitative or quantitative research (Bryman, 2012, p.72).

Therefore, after formulating our problem statement and reviewing the literature, it is important to choose the research design that will provide the strongest foundation for answering our problem statement, while formulating the research question, we have figured out what kind of information and data is needed to design the system of Kebabish. So, after looking at the above concepts, a case study is a suitable choice for our study as this thesis also studies a case on a single company and the empirical data is collected through the interviews and usability testing method. According to Denscombe, the major feature of the case study is it emphasizes on just one instance of the thing being explored. It allows the researchers to gain more insights and discover things that might not have become clear through other research strategies (Denscombe, 2014, p.55-56). Our research also applies cross-sectional design as we collected our empirical data through focus groups, interviews and card sorting method. According to Robins et al. (2008), the combination of qualitative and quantitative research can highlight the similarities and distinctions between

particular aspects of the phenomenon. The authors have also mentioned that to get a better understanding of different issues of research; use both approaches rather than using one approach. So, we have used both qualitative and quantitative research approaches for our study.

3.2.1 Data Collection

We have collected the empirical data for our research through both primary and secondary sources. There are several methods to collect data such as interviews, card sorting, and various documents. These methods are applied in our study as it emphasizes on discovering the thoughts and ideas of the stakeholders of the restaurant regarding the development of the website for the employees. And the data collected are used to get a clearer image of the things. (Denscombe, 2014, p.163).

i. Primary Data Collection:

To collect the primary data, we have conducted focus groups and interviews. A research interview is a method of data collection in which it uses the respondent's answers to the researcher's questions as their source of data. This suggests focusing on self-reports, what people say they do, what they believe, and what opinions they say they have. Therefore, the words of interviewees are used as research data that is both 'on the record' and for the record (Denscombe, 2014, p.184). Three things need to be considered while interviewing are, first one is the possibility of obtaining access to the potential interviewees, the second thing is the cost and the time of interview and lastly the third is the data that is needed for the research project(Denscombe, 2014, p.185). This thesis studies a case company named Kebabish ApS, an Indian restaurant, and the interview is conducted with Nazakit Mahmood, the restaurant manager, and also with few staff members. From both parties, we get their responses and opinions.

ii. **Secondary Data Collection:**

Secondary data represents those sources of knowledge on which the conceptual context of this study is based on that is the subject areas of user experience design and empathy (Saunders 2016.p.316). These data are taken into consideration to answer the research questions and meet the objectives. Scientific articles have been used in the study and these were taken from the RUC library, books, and other online sources. These sources have been used to analyze various literature reviews and concepts linked to the research subject. Similarly, these sources were also used to check if the theories that have been used in this study are still valid or not. Besides, the website of the restaurant has also been used to get the basic information about the restaurant.

Here we will present the data collection methods which are used in our study. For our study, we have used focus group and interviews.

3.2.2 Focus groups and Interviews**:**

Focus groups:

Focus group discussions involve small groups of people who are gathered together by the 'moderator' to discover thoughts, views, and insights about a particular topic. There can be 6 to 9 people in a group if possible, but it depends on the scale of research. So, in small scale research, there can be a smaller number of people in focus groups. The three unique characteristics of focus groups which differentiate them from other types of interview. The first one is, there is always a focus on the session when there is a group discussion about the thing or experience

based on the similar knowledge of the participants. The second characteristic is the role of the moderator is to 'facilitate' the group discussion instead of leading the discussion. And the last one is certain importance is set on 'group dynamics' to extract information from the group interaction. The excellent thing about this focus groups is that it motivates all the participants to discuss the topic among themselves. This will help the researcher understand the thinking behind the ideas and views of the participants. Since this contains a group of people, there must be trust between the participants and participants, and also between the participants and the researcher. Everything should be confidential and there should be a feeling of assurance to all the members when they expose some of their personal feelings. So, focus groups is the best method when we have to collect qualitative information from an enormous group of individuals. Through conducting surveys, it is not possible to get the information that we can get from focus groups since surveys give quantitative information whereas focus groups help us to understand the views and behavior of the users. Collecting information from focus groups might be challenging and time-consuming for data analysis. When there is an enormous group of people then there can be people with distinct personalities like some individuals can be shy and quiet and some individuals can speak too much or he or she can be too expressive (Denscombe, 2014, p.188-189).

For our study, we had a focus group session with 8 members. The session was held in the beginning phase of the research in the restaurant and lasted for an hour. The agenda of this session was to know and understand the thoughts of the participants about a new website that is being designed and the problems they were facing for not having any proper system to do any task related to their work. Before starting the session, I gave them a brief description of the aim of doing this session and the reason for performing the research. I assured the participants that there would be complete confidentiality of them as I would not mention their names in this report or in any other report. I also made sure to them that the feelings related to their personal lives if they expressed during the session would be kept secret and confidential. As we were colleagues and have a connection, not to affect the discussion and have a neutral investigation, we kept a professional distance relationship during this session. As mentioned by Denscombe, the success of the focus group depends on the formation of trust in the group and the job of the moderator is to make them relaxed to communicate with no obstruction. So, we made sure that it was properly maintained during the session by making sure that everyone is feeling comfortable and are free to share what they feel about certain issues. Since most of the participants were familiar and have some knowledge about the features of other websites which they use in their daily lives, it was a successful session to have unique views and opinions from the participants. These staff also have a job in another place and they are used to similar kinds of systems and beside them, other staff have not seen or used this kind of system, so it was a challenge for me to work with them. First, I need to make them understand what the system is about and how it will help them in their work style. So, they were the beginners who needed to learn to use this system but still they provided me with their ideas about what they would want if there is any system to be designed. The comments made by all the participants were recorded on the iPad to maintain the concentration during the session and also not to lose any information from the meeting and later can be used for documentation.

Interviews:

An interview is the planned interaction between the interviewer and the interviewee where they are engaged in a series of questions and answers on a particular topic of interest to the researcher. Structured, semi-structured, and unstructured interviews are the interview types, and these are classified according to their flexibility in the meeting's structure (Denscombe, 2014,

p.186). In structured interviews, the questions are prearranged and follow a strictness on the format of questions and answers. Semi-structured interviews are prepared to be flexible in terms of the topic considered and allows the interviewee to develop ideas and speak more widely on the issues presented by the researcher. The respondents' answers are open-ended in this interview. And in unstructured interviews, the interviewees may develop their ideas and thoughts rather than the discussion formed by questions that came from the researcher's mind (Denscombe, 2014, p.187). Therefore, semi-structured interviews were chosen as the source of data in this thesis. This method is applicable as our study focuses on small scale research and investigates the issue.

- **Conducting Semi-Structured Interviews:**

According to Denscombe, a semi-structured interview is the most preferred type of interview, which is flexible and permits the interviewee to provide detailed information and speak more from his or her interest. So, though the questions are already prepared by the researchers based on the topic the researcher must put more emphasis on the interviewee elaborating more on the issues that are presented by the researcher (Denscombe, 2014, p.187). To understand the stakeholders of the system and understand the user's requirement for the designing of the system, we have used this semi-structured interview where the questions would be open-ended.

Since the manager of the restaurant was marked as the key contact person for our case. So, I realized, to have a meeting with him at the beginning. As I was one employee, we held the interview in the meeting room of the restaurant. Before starting the interview, I briefed the manager about the purpose of this research and informed him that there would not be any disclosure of the private information if it is expressed in the meeting. Informing the participant about the purpose and structure of the interview will help to run the interview smoothly. The interview was designed with a preliminary developed interview guide which contains open-ended questions. The interview guide often includes topics, open-ended questions, closed-end questions, and follow-ups to guide the interview (Bryman, 2012, p.473). The interview questions were based on the restaurant background, manager's views, interest in the research topic, and the problems of not having a specific system. The interview was recorded on the iPad for later documentation of the participant's statement. The audio recording was transcribed for data analysis and noted the important statement made by the participant. Denscombe (2014) believes that audio recordings offer a permanent record, and it gives them the freedom to concentrate on the dynamics and topics of the interview.

According to Kvale (1996), in the qualitative interview, the questions that are asked are highly changeable. Kvale (1996) has recommended nine types of questions that can be included in the qualitative interviews. The types of questions are introducing questions, follow-up questions, probing questions, specifying questions, direct or indirect questions, structuring questions, silence, and interpreting questions. Most of the interviews include these questions since these questions offer topics that support free structure (Denscombe, 2014, p.477-478).

Interview questions for the manager are:

1. When did the restaurant start?
2. How many members are working now in the restaurant and where are they from?
3. Who is the restaurant's food partner?
4. How do you follow the safety regulations in the restaurant?
5. How often do doctors (control-check) visit your restaurant?

6. Who designs the restaurant's website and menu of the restaurant?
7. Who is your food delivery partner?
8. What do you think about this research project?
9. What are the problems you are facing now to work without a proper digital system?
10. What are your expectations regarding this new website?

- **Online interview:**

Because of the pandemic, the plan to conduct a semi-structured interview with the staff of the restaurant did not work. So, I have used an online interview technique to communicate with them. According to Denscombe (2014, p.197), we can conduct an online interview with anyone who has access to the computer and the internet. We can conduct this interview with or without visual contact between interviewer and interviewee. I have used some communication software like Skype or other social media like Facebook to have an online interview to have a visual interaction. And we can also conduct online interviews that do not include visual communication also and we can do it via email correspondence with a sequence of written questions and waiting for the answers from the respondents. Besides mail, we can use social networking sites or text messaging. Therefore, we can conduct an online interview using any communication programs available.

After the focus group session with staff in the early phase of the research, I held this meeting to move further in the designing process with the responses of the respondents. I conducted this interview with 5 participants, one manager and four staff after I provided them with the wireframes of the different pages of the website and the open-end questions. I sent the wireframes and questions through the mail to all the staff. Since it was our second meeting, and they were familiar with the topics of the research topic, in this session they were more motivated to express themselves more freely and comfortably. The interview was designed with a preliminary developed interview guide which contains open-ended questions. The interview questions were simple and understandable. The principal aim of designing this question was to know their opinions, views, and expectations from this website. I interviewed them separately because it is not an excellent idea to do a group interview since I need to collect detailed information about each individual. This interview session was beneficial to me as I got to discover several fresh ideas and opinions, and this allowed me to be closer to making the best design. Based on the booklet by IDEO(2011) according to the HCD toolkit, in the 'hear' segment, I listened to my users' feelings, thoughts, ideas, then in the 'create' segment with the collected information from them, I created wireframes of the website and last in the 'deliver' segment I provided them the prototypes of the design of the website.

Interview questions for employees:

1. How do you feel about having this website?
2. What is the most important feature of the website?
3. List out the important pages you want on the website?
4. Are there any features you do not find helpful?
5. Does the page contain the information you are looking for?
6. Which page is the least useful on the website?
7. What do you think about having a schedule page in the system?
8. What information would you like to include in the schedule page?
9. Do you think it will make your work easier and more efficient?
10. Do you have any feedback or any idea to make this website more useful?

3.2.3 Participants**:**

As I have already mentioned that relevant stakeholders of a web project will be the subject of this research. So, the participants of this research are the staff and manager. The project of this research is about designing a website for Kebabish ApS, especially for employees. Therefore, the users are waiters, cashiers, chefs, kitchen assistants, cleaning assistants, dishwashers, and the managers. Though the website is for the employees, some staff did not actively take part in the process since few of them were not familiar with this project and they do not have enough knowledge about the current technologies. Besides these staff, those who took part were familiar and knowledgeable as they have been using various websites for different purposes in their daily lives. They helped me in the process by providing their comments and thoughts about their previous experiences using other systems and expectations they have from this website. Among 15 employees, 5 of them were behind the scenes during the process and 10 of them have actively taken part.

3.2.4 Design Thinking:

For this study, we need to research user expectations for which we need to do users research, findings, and testing so we chose a design thinking procedure. To give a better solution to our users' understanding of their needs and desires, we have used design thinking. Since design thinking is the process where we interact with the users, in the beginning, trying to understand their needs, requirements, and problems and then we try to find an appropriate solution so we found this method as the best solution for our project. The first phase of design thinking is empathizing with the users. Following the design thinking process guide by Stanford University (2016), in the early phase of this research as the focus group and interview session with the manager was performed, I could identify and understand their thoughts and behaviors by watching them. Besides these, it also helped me to discover the clear and hidden needs of them which will be met through the design. The primary need of the users is a system where they can have the information regarding their shifts, their hours, a platform to connect with colleagues, restaurant' s events, and notices. Despite this, they want to have a system easy to use and adapt. As it is already mentioned in the introduction chapter, that some employees do not have knowledge about the system and need to learn from the scratch so, the design should be made in such a way that it not only focuses on the needs of the users who can use the system but also focus to the needs of those users so they can learn and use the system.

Define, the second phase where the problem statement of this research is decided after having a better understanding of the users and the context. With the gathered information from the users, we need to construct our problem statement according to them, their wants, and the visions we have got in the empathize phase. So, we have considered the importance of empathy in the design process as the problem statement of this research. Now, the third stage is ideation where we perform brainstorming to figure out the solutions to the problems that have been discovered in the ideation stage. In this research, with the help of sketches, wireframes brainstorming was done. The sketches and wireframes were then given to the users so they can look at the ideas of the designer and share their opinion if they want something added or improved. After this ideation phase, we have a prototype phase where we design a prototype of any kind, which might be a sketch, a paper prototype, or a mockup. This is an important stage in the design process as unless the real user does not test the product, it is difficult to reach to the ultimate solution of design. And after prototypes are created, then the last phase of design thinking which is a test. When the

prototypes are handed to the users, for the test then the researcher must ask them to provide feedback so that they can improve through iterations. This phase helps the designers to enhance their solution until the users are satisfied with the provided solutions.

Since this process was performed in a critical condition when there was no contact with the individuals, so most of the research is done sitting in the home or through the use of online sources and tools, the process was not like doing in the real world. It was difficult to communicate with the users through online sources and there was no complete observation of users' behavior. In this research, the way of being empathized with our users was at the start of this research when there was focus group and meeting and when they had difficulties in using an online card sorting tool 'UsabiliTest'. Most of the participants had difficulties when they have to do this sorting test since it was a new tool for them but after my explanation to them how does that tool works and what they have to do, they were able to complete this test.

3.2.5 Usability Testing

According to ISO 9241-11 (2010), the definition of usability is: "the degree to which such users may use a product to attain such aims with effectiveness, efficiency and satisfaction in a particular set of practice." The major purpose of the usability is to make sure that systems are simple to use, from the perception of the user. The primary usability method is user testing with real users since user testing delivers direct information about how people use computers and what their precise problems are with the definite interface being tested (Nielsen,1993,p.165). So, to identify the problem and address the user's requirement, we need to conduct usability tests. Nielsen has mentioned conducting a usability test helps to study users and their interaction with the system (Nielsen, 1993, p.209). To understand if the specific feature is functional or not, we should conduct usability testing which provides larger information about the use of the product by people (Goodman et al., 2012, p.274). By collecting quantitative data, we can evaluate the overall quality of the interface which Nielsen has mentioned as a summative usability test (Nielsen,1993, p.170).

Reliability and validity are essential measures in creating and measuring the quality of research. So, we must consider the problems related to reliability and validity when we conduct usability testing. Reliability in research examines if the output from the test is the same if the test is repetitive and validity in research examines whether the output of that test displays the usability problems that must be tested. As every individual has unique characteristics, when we conduct usability testing among many test users, reliability becomes an enormous challenge. The best way to get reliable results in usability testing is when we repeat the same test with different test users (Nielsen, 1993, p.166). When we include wrong users in the test, or we provide the wrong task to our test users, the validity problems occur in that specific test. To get a valid result, we must make sure that in the specific test, the result from that test must be the one we want to test (Nielsen, 1993, p.169).

Card Sorting

The method that is used by designers to design and evaluate the information architecture of a website is card sorting. So, we use the card sorting method when we need to design or redesign a new website and to know how our users want to see the information arranged in that website. Thus, it is an interactive research technique that helps us to understand our users' expectations and understanding of the topics (contents). When we have known the fact of how our users want to classify the information, then it makes our job easier to build the structure of our website and decide what to include in the different pages of a website. We can conduct card sorting in various

ways like using genuine cards, pieces of paper, or any online card-sorting software tools(Conrad & Tucker, 2019). According to the Conrad & Tucker, card sorting provides some advantages when included in qualitative interviews:

- Card sorting assists the study of human perception, emotion, and another practical occurrence or event.
- It makes human-centered design and analysis easy.
- It decreases misunderstandings by refining the common understanding between researcher and participant.

There are three types of card sorting and they are:

a) Open card sort:

In this card sorting method, we request participants to organize the topics from the content of the website into groups based on their ideas or views, and they can label each group that describes the content perfectly. Open card sorts are the best choice for exploratory studies that use qualitative data analysis, as resulting data can vary. Here the information that needs to be classified is not pre-defined. The crucial difference of open card sort with closed card sort is that it is more often used than closed card sort and we can learn more from this method about the groups created by the participants and the information that goes into that group. In this method the foremost thing that we need to remember is that we should not let our participants be free, instead, we must ask our participants to emphasize certain areas about what we prefer to research. This method is used to identify the location of the content. We can ask them to consider the key audience groups, major tasks they want to perform, and the phases of the process (Spencer, 2009).

b) Closed card sort:

In this card sorting method, we cannot collect much information like in open card sort because we could not discover the groups people would create. There are some situations when this method is much more suitable than open card sort like when we have pre-defined groups that we know cannot be modified and need to explore where the contents would go. When we have an existing structure and only need to add a few contents on it and when we want to study the arrangement of contents in-depth, then we can use this sorting method. Besides these, we can use this method for others such as we can use it as a means of communication, for making agreements, or as further user research (Spencer, 2009).

c) Hybrid card sort:

Hybrid card sorting method is a combination of open card sort and closed card sort. We present the items and categories to our participants in this method and also let them create their categories if they want. We need to choose the sorting methods as it might be open or close depending on the conditions and categories we have already constructed. This method is useful in producing ideas for gathering information (Conrad & Tucker, 2019).

Card sorting techniques

After having an idea about distinct types of card sorting methods, the next phase is to include participants in a team or individual while planning a card sort. The choice we make will determine our skill of decision making and this will also determine the variety and trait of the data that we

would gather (Spencer, 2009).According to Spencer, there are two types of card sorting techniques:

a) Team Card Sort:

In this card sort, there is a discussion among participants about their decisions to move the cards, various ways to place the card in the groups, an inquiry about the contents, their opinion about the use of the content. This is crucial and valuable information for the researcher than the result they get from the card sort because these arguments can help the researcher have the best understanding. Along with the advantages, there is also a disadvantage of this sort as it involves a group of people, in any group, there might be someone in a team who has a dominating nature and this might affect the whole process as he or she can force his or her idea on others, then the consequences would show an idea of a single person rather than of a team. Alternatively, some teams can agree on negotiating rather than working on their dissimilarities and the consequences of this would be meaningless (Spencer, 2009).

b) Individual Card Sort:

This card sort involves the researcher and the participant and is much easier to manage than a team card sort. It is also beneficial as it helps us to get a higher number of replies. When we are doing card sort face to face then, this technique provides the participant a chance to think aloud while sorting the content and the researcher will take notes of the participant's thinking process. These notes will be helpful to grasp the participant's choice of sorting topic into specific content. Though this method collects much information but there are not any arguments in this method like in team card sort (Spencer, 2009).

Using Both methods:

We can use either of them between team card sort and individual card sort, or we can also use both techniques. With team card sort technique, we could study the reason people categorize the cards as they normally perform, and with individual card sort, we can get more data from the same amount of people as in team card sort. It does not count which technique we apply, since the main purpose is to watch the process and in their discussion besides listening to them, we can watch them classifying the cards and we can see the cards which were classified more easily, cards which were moved from one group to another, and which card is not picked till the completion of the method (Spencer, 2009).

Chapter IV: Findings and Analysis

4.1. Findings through Card Sorting

To identify and understand the users' opinions of the Kebabish ApS's website, I performed a participatory design using the card sorting method. There are various online card-sorting software tools like Optimal workshop and UsabiliTest and different card sorting analysis spreadsheets like Excel spreadsheets by Donna Spencer (2016) and Co-occurrence matrix developed by Mike Rice (2012) (Conrad & Tucker, 2019). The difference between these tools can vary in interface design, the number of items they sort, and the outputs they produce These online card sorting tools are like the manual card sorting as the cards look like actual cards and can be dragged into the categories on the screen. Some advantages of using these tools are (Spencer, 2009):

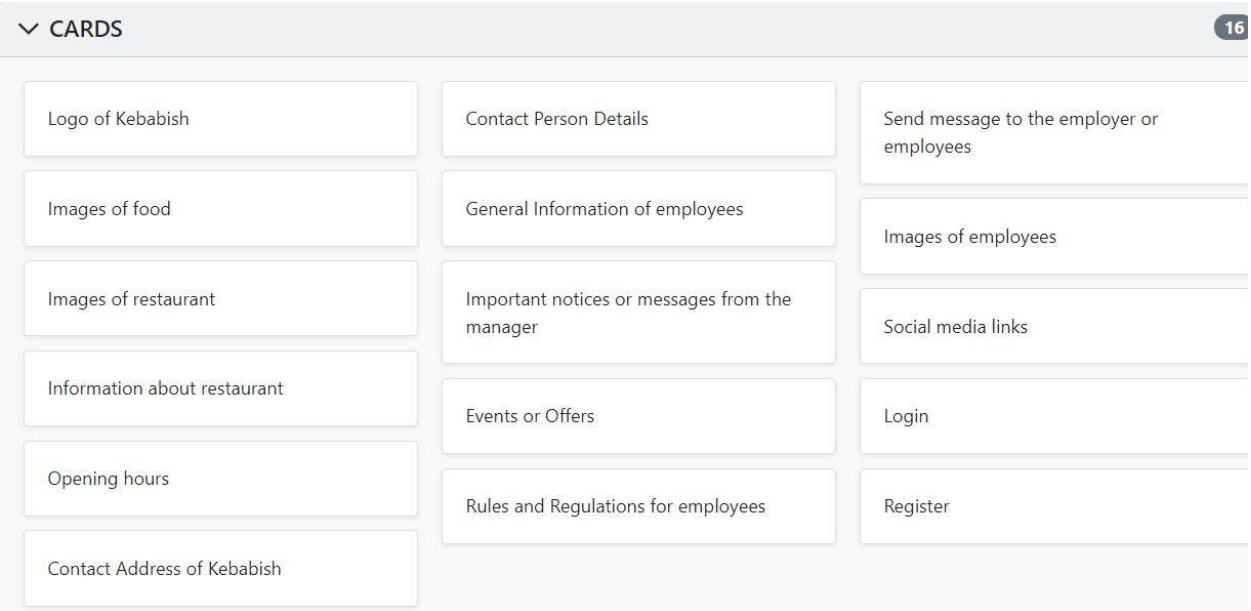
- Since it is an online tool, the participants from any corner can take part in the method.
- In this method, there is no manual process to enter the outputs from the card sort into a tool for analysis, these outputs enter the tool automatically.
- We can involve more users in this method than face-to-face sort methods.

The major difference between manual and software card sorting methods is that the physical involvement of users in the manual card sorting method makes the task more spontaneous and the researcher can observe their users closely performing the method. Whereas in software card sorting, though there are some advantages of this method, the drawback is that this is not spontaneous as the manual sort and it is difficult for the novice users to use these tools (Spencer, 2009).

In the early phase of my research, my priority was to use the manual card sorting method, but the situation made me use the online card sorting tool. I have used UsabiliTest, an online tool to perform card sorting. Among distinct types of card sorting methods, I used closed card sorting because it was not a simple task for every user to create the categories and place the card into those categories. It would have been possible to guide and help the user to So, I created the categories that would be in the website and provided them with a series of cards with contents and asked them to organize and sort in the categories where they think it is suitable. Among 20 users, 10 of them took part in this card sorting method. The chief purpose of performing this method was to collect the information from the users to design the information architecture, structure of the menu, navigation bar of the website.

Card Listing:

The first phase in the card sorting method is the card listing. The list has 16 cards as shown below the logo of Kebabish, images of food, images of the restaurant, information about the restaurant, opening hours, contact address of the restaurant, contact person details, general information of employees, notices or messages from the manager, events or offers, rules and regulations, message to employer or employees, images of employees, social media links, login, and register.



Categories:

After the listing of cards, I have listed 6 categories like main page, homepage, member page, notice, contact, login, or register to shape the structure of the website.

Category 1:	Mainpage
Category 2:	Homepage
Category 3:	Member page
Category 4:	Notice
Category 5:	Contact
Category 6:	Login/Register

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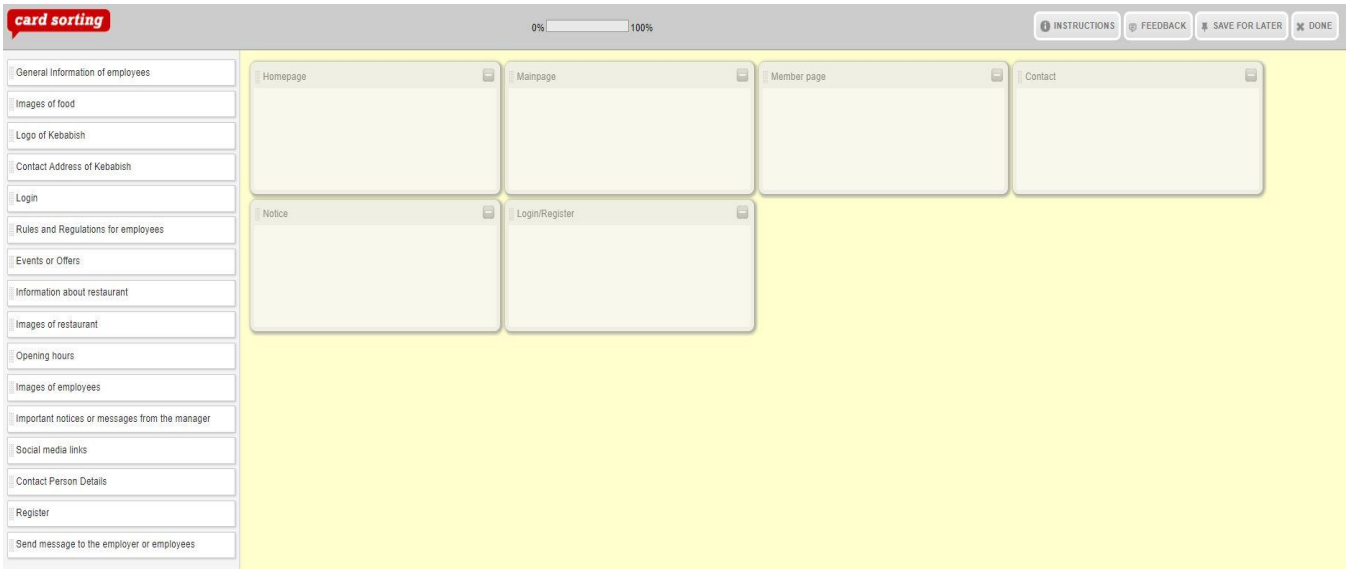
Implementation of Card Sorting:

After listing the categories, the study for the website of Kebabish has been started, and it is provided to 20 participants. The link to this test was delivered to them through the mail and also through the messaging site as we have a chat group in the application called WhatsApp. The figure below displays the user interface of card sorting for the Kebabish website.



4.2 Findings through Design thinking

Based on the literature review and through the understanding of the concept of design thinking, we came to know how to understand the requirements of our users when they are also not aware of their requirements. We found out solutions which we can apply when we need to understand our users' needs in such a condition when they also do not know what they need.

- **Listen to the problem, not the solution:**
  Most of the users would like us to tell them how to solve their problems. In this situation, the job of designers is to find solutions to the problems by listening to the users' problems that they are having and figuring out the best way to solve those problems. Sometimes users do not really know what they want, so being their designers, we need to show it to them first.

- **Ask questions:**
  When we are done with asking pre-designed questions to our users, we must ask them more. Since users are rarely forthcoming with details, we must inquire about them so we can gain more information from them.

- **Get things in writing:**
  Depending on the situation with the users, this can be important later when they complain about how and what we delivered "isn't what they asked for" and if nothing else, so to avoid this situation writing out detailed specifications can help us make sure we have all the information we need, and help clear up ambiguities between us and the client.

- **Communication is key:**
  We should not only talk with our users rather we should get the information and need to develop something (e.g. sketches, wireframes), not to talk with them until it is done. We should always keep in touch with them and should ask questions, thorough out the process, show them the progress that has been made, and get the feedback. This will make everyone's life easier in the long run.

4.3 Data Analysis

The empirical data was gathered through focus groups, interviews, and card sorting method. Secondary data were considered to analyze the findings of our study. The principal purpose of performing analysis to any study is to define its fundamental elements, clarify how it works, or understand what it means. So, we should analyze the particular thing if we want to have a better understanding of it (Denscombe, 2014, p.477-478). During the interview session with the manager of the restaurant, the interviewee's spoken words were audio recorded by the interviewer. These were analyzed to plan the empirical findings of the restaurant. The focus groups and card sorting were conducted to analyze the employees' perspective on how they want the structure of the website to be. We analyzed this perspective based on the literature review and theoretical findings that we have discussed in the above-mentioned chapters.

4.3.1 Reliability and Validity of thesis

This thesis is based on both qualitative and quantitative research. Based on the qualitative research approach, the reliability of the thesis is evaluated through its credibility (validity), dependability(reliability), transferability (generalizability), and confirmability (objectivity) (Denscombe, 2014, p.297). The researcher becomes an important part of the data collection method as an interviewer, observer, or participant. The main issue of reliability is that whether the research tool generates the same result, even they are done by different researchers. One way of dealing with this issue is by 'dependability' called by Lincoln and Guba (1985). Their research suggests methods and choices that other researchers can watch and assess in terms of how far they establish dependable methods and reasonable choices. This works as a substitution for

being able to duplicate research. So, to check the reliability of research, the research process must be open for audit (Denscombe, 2014, p.298). Credibility (validity) states to the extent to which the researchers can show that their data are accurate and appropriate. To address the accuracy and appropriateness of the qualitative data, the researchers can use respondent validation, grounded data, and triangulation (Denscombe, 2014, p.298). During the interview and focus group in our study, the ideas, views, and experiences of our respondents were studied and analyzed.

When the interview and focus group were conducted, the study choices have been made in such a way that they were suitable for the research question of this research. The case company that is chosen is in Denmark. The respondents have been chosen and contacted as they were the right ones to answer the questions. The semi-structured interview and online interview are data collection approach which is used in this study that provides the respondents to produce opinions and speak freely on the issues that are mentioned by the researcher (Denscombe, 2014, p.187). During the focus group and interview session, the accuracy was maintained by recording the interviews. Therefore, the reliability and validity of this study were ensured by collecting data and information from various sources like journals, previous reports, books, and the company website of Kebabish.

4.3.2 Ethical Consideration

The basic characteristic of good research is research ethics. Thus, social research must be performed in an ethically. Ethical consideration is usually required during the research that includes data collection from or about living people (Denscombe, 2014, p.307). In our study, during interviews or focus groups, we have performed these methods by following some ethical considerations. Social research must be conducted in such a way that it protects the concerns of the participants. It must ensure that participation is voluntary and grounded on the informed consent. The social research must avoid dishonesty and operate with the scientific reliability. And also, it must obey the rules and regulations of the country (Denscombe, 2014, p.309). These mentioned concepts are usually defined as the codes and conduct that must be followed by every researcher while conducting the research.

Throughout this thesis, all the foremost ethical concerns are addressed and followed. Before interviewing, the interviewees were contacted and informed about the background of this study and requesting an interview with them following their respective time. This helped them to be prepared since they understood what questions could be asked during the interview session. The interviewees were not compelled to answer the questions during the session. The data provided by the participants were kept confidential. Further, the secondary sources that are used in this thesis are appropriately acknowledged and referenced.

4.4 Analysis

This chapter discusses the result and the analysis of collected data from different data collection methods. At first, the stakeholders of the Kebabish ApS are identified. Then the result of the card sort, interview with the manager and the employees will be discussed.

4.4.1 Stakeholder analysis

Stakeholder analysis helps us to identify and understand the stakeholder from the perspective of the company or to determine their interest in the system's product. To find out the main stakeholder of the system and their level of interest, the description provided by Alan et al. (2004) on how to identify the stakeholder of the system is used. The analysis of the stakeholder will

answer one of my research questions: RQ1. Who are the main users of the proposed system of Kebabish ApS? To provide the answer to this question, we need to identify the stakeholders of the restaurant.

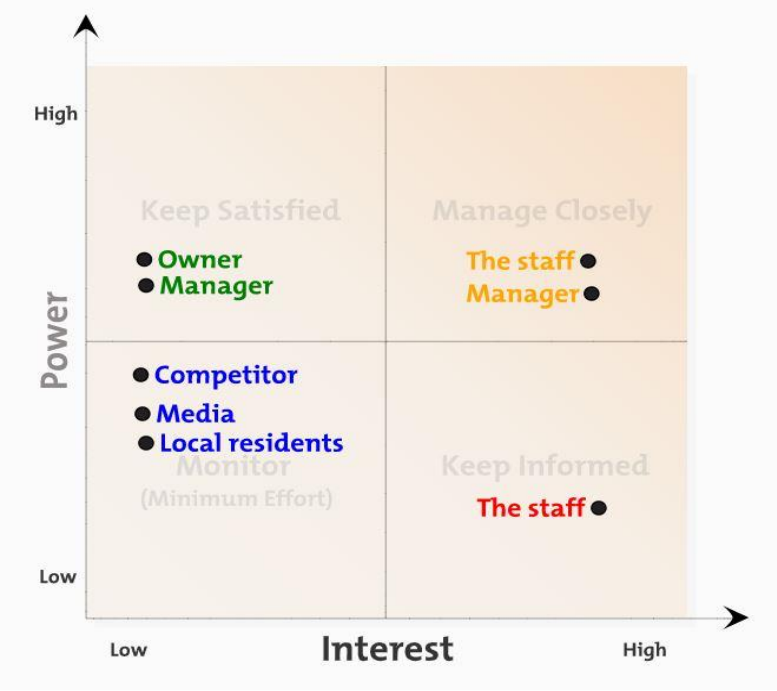
According to Alan et al. (2004, p.458), stakeholders are the people who are affected directly or indirectly by a system. They categorized the stakeholders into four major groups: Primary, Secondary, tertiary, and facilitating. The primary stakeholder is the main user of the system who has high power and high interest. Secondary stakeholder has some interest in the system where they provide the input and receive the output but does not really use the system. Tertiary stakeholders have low power in the system but somehow get affected by the success and failure in the system. Last, facilitating stakeholders are the people who design, develop, and maintain the system(Alan et al., 2004, p.459).

Based on this, the categorization of stakeholders in Kebabish ApS:

- Primary stakeholders (Keep Satisfied): Owner, Manager
- Primary stakeholders (Manage closely): Manager, Staff
- Secondary stakeholders (Monitor): Competitor, Media, local residents
- Tertiary stakeholders (Keep Informed): Staff
- Facilitator: Designer

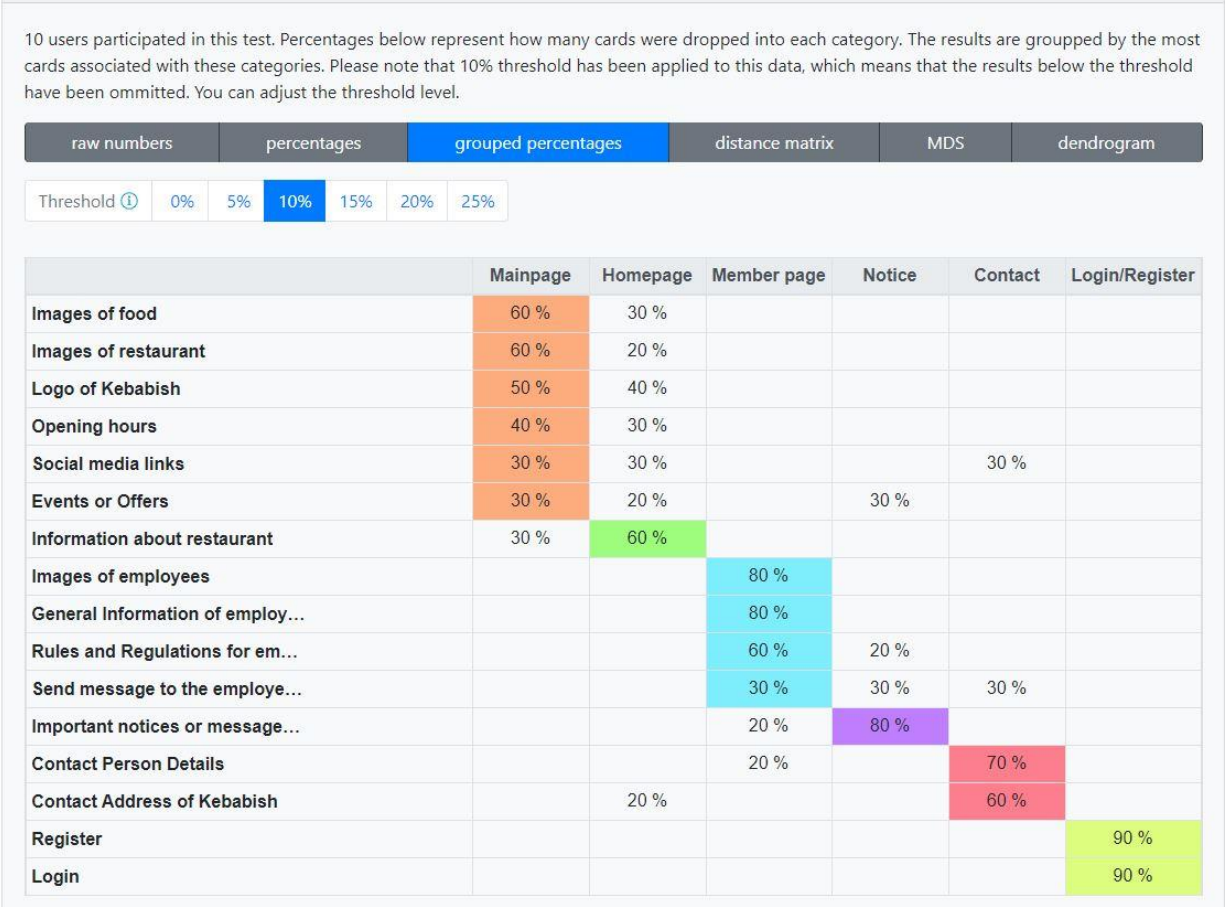
Below is the Stakeholder Analysis is done by presenting in depending on the level of power or interest in the Interactive Screen App which is a software available in MindTools (Mendelow, 1981).

- Keep Satisfied: High Power and Less Interest
- Manage Closely: High Power and High Interest
- Monitor (Minimum effort): Low power and Low interest
- Keep Informed: Low power, High Interest



4.4.2 Card Sorting analysis

Among 20 participants, 10 participants have participated in this test. The result of the card sorting has been generated by UsabiliTest and the result matrix is presented below:



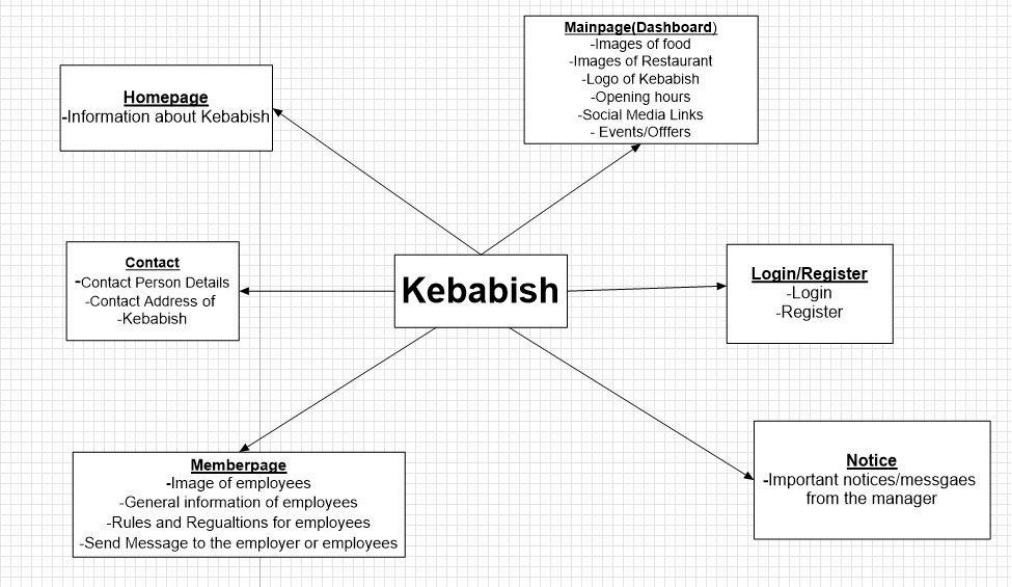
10 users participated in this test. Percentages below represent how many cards were dropped into each category. The results are groupped by the most cards associated with these categories. Please note that 10% threshold has been applied to this data, which means that the results below the threshold have been ommitted. You can adjust the threshold level.

raw numbers | percentages | grouped percentages | distance matrix | MDS | dendrogram

Threshold ⓘ 0% 5% 10% 15% 20% 25%

	Mainpage	Homepage	Member page	Notice	Contact	Login/Register
Images of food	60 %	30 %				
Images of restaurant	60 %	20 %				
Logo of Kebabish	50 %	40 %				
Opening hours	40 %	30 %				
Social media links	30 %	30 %			30 %	
Events or Offers	30 %	20 %		30 %		
Information about restaurant	30 %	60 %				
Images of employees			80 %			
General Information of employ…			80 %			
Rules and Regulations for em…			60 %	20 %		
Send message to the employe…			30 %	30 %	30 %	
Important notices or message…			20 %	80 %		
Contact Person Details			20 %		70 %	
Contact Address of Kebabish		20 %			60 %	
Register						90 %
Login						90 %

Based on the result matrix shown above, there were unique views about the outline of the navigation system from the participants. At the beginning of the test, many users had a confusion between the main page and home page. So, I explained them, the idea behind creating the main page was considering it as a landing page or a dashboard whereas the home page was created for the separate page which contains brief information about the restaurant. As labeled in the result matrix, the website of Kebabish is show presented in the mind map below:



4.5 Designing

4.5.1 Design process:

According to Leavitt & Shneiderman (2006), to design a website that assists best individual performance, certain guidelines that need to be followed by designers before they design, and they are:

- **Provide useful content:** Content is the most important element of the website. It can be text, images, data, messages, etc. that are printed on the website. So, we should only include the content that is attractive and appropriate to the audience.
- **Establish User Requirements:** To create an excellent design, we must use all the sources to have a better understanding of user requirements. The more we share the information with the users, the more we can learn about them and it enhances the chance to have a successful website. We can create user requirements through interviews, surveys, focus groups, etc. From the gathered information we can build use cases. Use cases are used to explain the needs and wants of the users from the specific website.
- **Understand and meet User's expectations:** Designers need to understand their users' expectations through task analysis and other research methods. Users' expectations are based on their previous knowledge or past experiences. A study discovered that when users are familiar with the navigation arrangements and formats, then it is simple for them to learn and remember the layout of the website.
- **Involve the user in establishing user requirements:** In user-centered design, the central focus is a user throughout the process. To increase the completeness and accurateness of user requirements, we must involve users so we can avoid the unwanted or least used features. But a study explored that users are precious when they help their designers understand what the system must do, but when designers need to find out how the system can do it, then users are not much helpful.

- **Set and state goals:** Before starting to design a site, we must recognize the major objectives of the website. Goal is the important factor that defines the content, audience, function, and the site's appearance and impression.
- **Focus on performance before preference:** The foremost thing to make a successful website is making the best performance rather than its appearance. So, we must concern before on content, format, navigation, and interaction rather than concerning graphics and colors. The aesthetics makes the website attractive, but the success of a site is determined by the users' speed of performance.
- **Consider many user interfaces:** While creating a website, we should consider several issues related to usability. These issues contain the experience level of the users, evaluation of prototypes, the different tasks which the user will perform on the site, and the outcomes of the usability tests.
- **Be usually found in the Top 30**: One study found out that users do not visit to those websites, that are not in the 'top 30' from a primary search engine. The features of the website included in 'top 30' are proper meta-content and page titles, the number of links to the website, etc.
- **Set Usability goals:** When we set user performance or preference goals, then it helps us to develop better websites. This will also make the usability test more effective.
- **Use Parallel Design**: When the design decisions are made by a single designer or brainstorming of issues of design do not direct to the best solutions. The best method is the parallel design where designers individually evaluate the issues of design and suggest solutions. This will lead to the discovery of more varied solutions which will result in a better product.
- **Use Personas:** Personas are imaginary replacement for real users that are used by designers to be focus on the same kind of users. Through the use of personas designers can understand their users' needs, behaviors, and goals. And then they can create the interface that fulfills the desires and wants of the personas.

4.5.2 Design guidelines:

- **Homepage**

According to Leavitt & Shneiderman (2016, p.35-43), the first impression of any website is the homepage of that site. So, it must be distinct from other pages and it needs to have all the features that the homepage must-have, as it conveys the purpose of that specific website and displays the major choices that are presented on the website. Certain guidelines need to be followed when we design the homepage:

- **Enable access to the Homepage**: Most of the users revisit the homepage to begin the new task or start that task once again, so designers need to make a simple and clear path so the users can easily return to the homepage from any location in the site. Normally, in many websites' logos are placed on the top (left side) of every page and they are connected to the homepage. Though many users assume that a logo can be clickable, but it is unnecessary that other users also recognize that the logo is a link to the homepage. So, to solve this problem, we need to include a link named 'Home' near the top of the page.
- **Show all major options on the Homepage**: Since the homepage is an important page on the website, so we must be sure that only the important options and the links need to

be placed on the homepage. So, we must be careful with our choices with the topics and categories that are placed on the homepage.

- **Create a positive first impression of your site:** It is found in one study that when the participants were asked to search for great quality websites, then half of them only focused on the homepage. It shows that the homepage is the first impression on a user.
- **Communicate the websites' value and purpose:** Since there are many websites, most of the people divide their time to use different sites. This is the reason the website needs to convey its purpose and difference with other sites to its customer in less time.
- **Limit Prose Text on the Homepage:** The style of the text is to be used in the site must be clean and meaningful. Since users visit the homepage to look for major titles and heading, if there are many prose texts then it will bore the user to read and it might make the user leave the site.
- **Ensure the homepage looks like a Homepage:** The homepage of the website needs to have all the required features so it can meet with the users' expectations. As most of the users go through the homepage to look for important links, topics, a site map, perform a search, we should make sure that these characteristics are on the homepage.
- **Limit Homepage length:** We should be able to show all the important information on the homepage to the user that means that information must be placed on the above the fold. So, we have to make sure the user can see all the information without missing anything important and also without scrolling.
- **Announce change to the homepage:** When there is any change made to the website then we must inform them about the change that has been made and where the change is made.
- **Attend to Homepage Panel Width:** It is found in one study that the users ignored the information on the left panel because they did not realize that it was meant to be a left panel. So, we have to make sure that the width of panels must be wide to display important links and navigation fact but also must be narrow so that they do not take over the entire page.

❖ **Page Layout:**

The webpages need to be structured in such a way that it makes the user easy to understand the specific page. The items that must be placed on the page relevant to their importance. So, the important elements are placed usually to the top and center of the page. There should not be too much whitespace used in the page. Designers have to decide carefully regarding the length of the page. The page should include the required information, but they should be aware that too much scrolling is not a wise choice for any users. So, if the content or length of the page directs scrolling then they can use the panel where they can put the table of contents for that page which must be noticeable and easily reachable to their users (Leavitt & Shneiderman 2006, p.45).

❖ **Navigation:**

A navigation page is important to find the information on the website. With the help of navigation, users can find and connect to their target pages. The features and arrangements of the navigation must let the users to discover and approach the information successfully and competently. For easy navigation, the navigation elements should be distinguished and categorized. We can also use suitable types of menu. Some types of the menu are sequential menu and simultaneous menu. If the website contains many pages, then we must use sitemaps so it can deliver the vision of the website (Leavitt & Shneiderman 2006, p.59).

- **Scrolling and Paging:**

At the beginning of the designing process, designers must choose between scrolling and paging. This decision is based on the type of user and tasks to be conducted on the website. So, designers should think of providing many pages that are shorter rather than having two or more pages that are longer. And when the user needs to move often from one page to another then we have to make sure that they perform this capably. If there needs to be scrolling, then designers must let the quickest possible scrolling that is also only on some screenful (Leavitt & Shneiderman 2006, p.72).

- **Headings, Titles and Labels:**

The headings that are well-designed on the website makes it easy for the users to scan and read the material written. It is better to have many headings that are exceptional and expressive so users can easily find what they are looking for. Heading must be used in their correct HTML order and it should not avoid the levels of heading. Each page on the website should have a distinctive and informative title of the page. And if there is any crucial information on the page it must be highlighted so the user can notice it (Leavitt & Shneiderman 2006, p.77).

- **Links:**

The links are placed on the website for the comfort of the user as they can click the link and find what they are looking for. So, the designer must make sure that the link names should match with their targets, and items that are not clickable must not have the features of being clickable. Users should know that the particular item is clickable through different indications like underlining, coloring that item. Generally, texts are used for links than graphics as text link gives the appropriate information about the target. If there is an important link, then it is a good idea to make it available in different ways. Like we can provide the same link in the header and also in the left panel (Leavitt & Shneiderman 2006, p.86).

- **Text Appearance:**

There are many criteria of text that should be considered by designers when it is used on the website. The fonts should be familiar, black text on plain, backgrounds must be high contrast, to give a clear view of the categorization use different background colors (Leavitt & Shneiderman 2006, p.101).

- **Lists:**

The list on the website must be introduced clearly with a word or phrase and each list must have an expressive title. The list should be formatted in such a way that they can be simply searched. For this purpose, we can use bullet lists and numbered list. The first letter of the first word in the list must be capitalized. The order of the list increase user performance so the most essential items are located on the top of the list. To make lists easy to check and understand we can use significant labels, good background colors, white space, and borders (Leavitt & Shneiderman 2006, p.112).

- **Screen-Based Controls:**

Users use screen-based controls or widgets to interact with the website. The common widgets used include check-boxes, push-button, drop-down lists, entry fields, and radio buttons. Designers must use the familiar screen-based controls in the usual manner. The buttons of the website should be clearly labeled so that the user can easily identify the buttons. When users need to fill the forms or put a text in search boxes, they should be able to differentiate between the required and the optional information. Normally, designers use asterisk symbol in websites to label that box needs to be filled mandatory or they also use 'required' term close to the label. And also, users must not be asked to fill the same information twice. If it happens, then it means giving them more tasks and maximum chances of wrong entries. So, users must be asked to make minimum entries if possible. When users make any errors, then they should be notified by the site with some messages so they can correct them as per instruction (Leavitt & Shneiderman 2006, p.121).

- **Graphics, Images, and Multimedia:**

The logo of the company is the common image used in most of the websites. By using graphics, images, audios, and videos on the website can make the website remarkable. We have to be careful when we have to add these to the page because of the bytes of the pictures. These pictures might take a longer time to download when there is a slow internet connection thus, to this issue it is better to use the thumbnail version of greater images. Unnecessary to download these images by users, they can preview these effortlessly. The images used as the background of the page can make the loading of that page slow and also make it difficult to read the text is at the forefront of the page. Designers should be careful while locating the images on the page, so they should not be positioned at the place of advertisements (Leavitt & Shneiderman 2006, p.143).

- **Writing Web content:**

Content is a crucial part of the website. It does not matter how beautiful the appearance of the website is if the content of that website cannot provide the information its website is looking for. So, the content should provide the information required by the users. To make the content, designers should use familiar words and prevent using jargon words. When designers need to use acronyms and abbreviations, then they must make sure they are clearly defined and understood by the users. To improve the readability of the text of the website, a sentence should be of twenty words and a paragraph should be of six sentences (Leavitt & Shneiderman 2006, p.159).

- **Content Organization:**

After the content is well written then it needs to be organized. Designers must arrange the content by placing the important information close to the top of the site, classifying the connecting element, and making sure that all the essential information is accessible. Content of the website must be arranged with well-positioned headings, short sentences or phrases, small paragraphs so that users can easily skim and understand the purpose of the website (Leavitt & Shneiderman 2006, p.170).

❖ **Search:**

This is also one of the important parts of the website. A search box on the website allows users to get the information they are looking for with the entry of one or more than one keywords in that certain box. So, this search box needs to be on each page of the website for the convenience of the users. The keywords that need to be entered in the box must accept both lowercase and uppercase to make the job of search to the user easier (Leavitt & Shneiderman 2006, p.180).

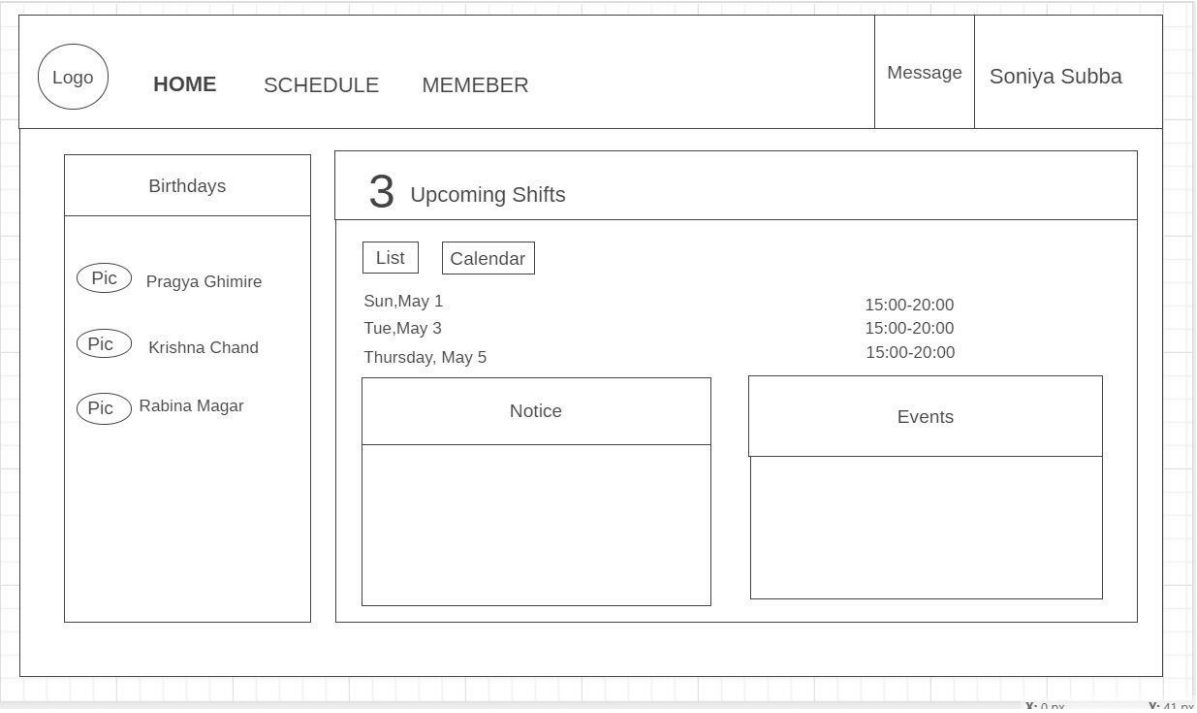
4.5.3 Wireframes

Based on the literature review, the most common way of making wireframes is by using pen and paper. This is the easiest task as there is no special skill required to do it. And for the professional users or designers, there are several applications available designed to sketch wireframes. In this research after collecting data that is required to design the website, to give it a visual representation of their ideas and thoughts, the sketches are designed in a simple version.

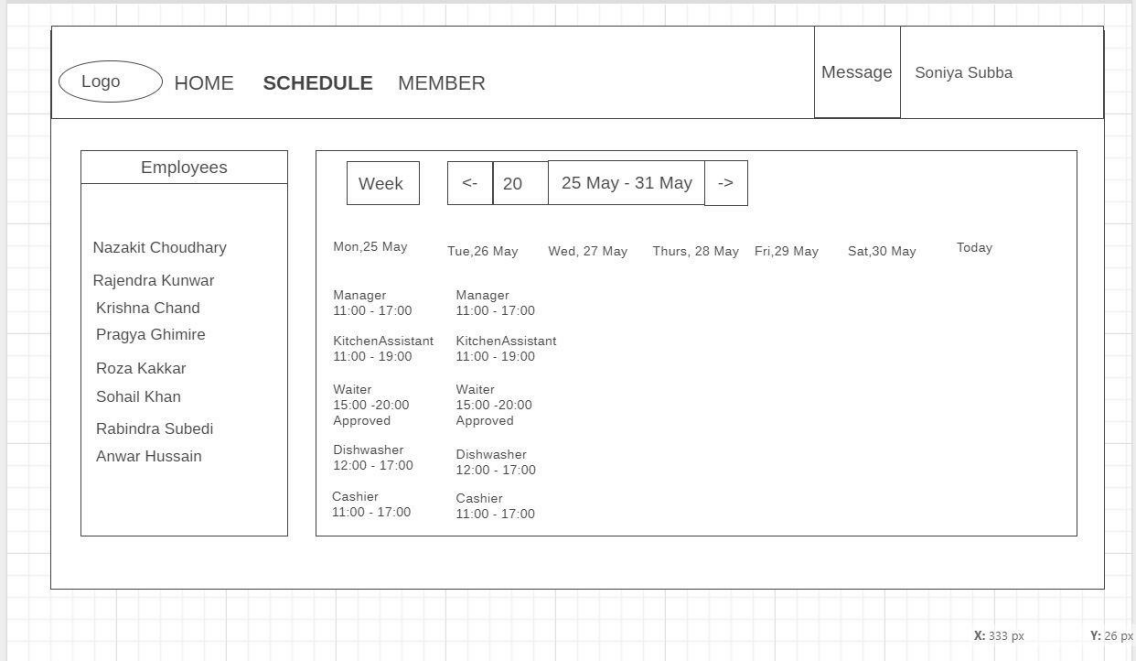
After collecting the feedback from the participants, the 2nd draft of the wireframe is designed. Since there was a confusion between the main page and the homepage. Now, there are four pages of a system and they are Login Page, Home page, Schedule page, and Member page. Notice page and Contact page are removed, and they are included: as a section 'notice' is on the Homepage and the contents of the Contact page is now included in the Member page. Only the Login page remains the same.

These are the wireframes of the main pages of the designed website of Kebabish ApS:

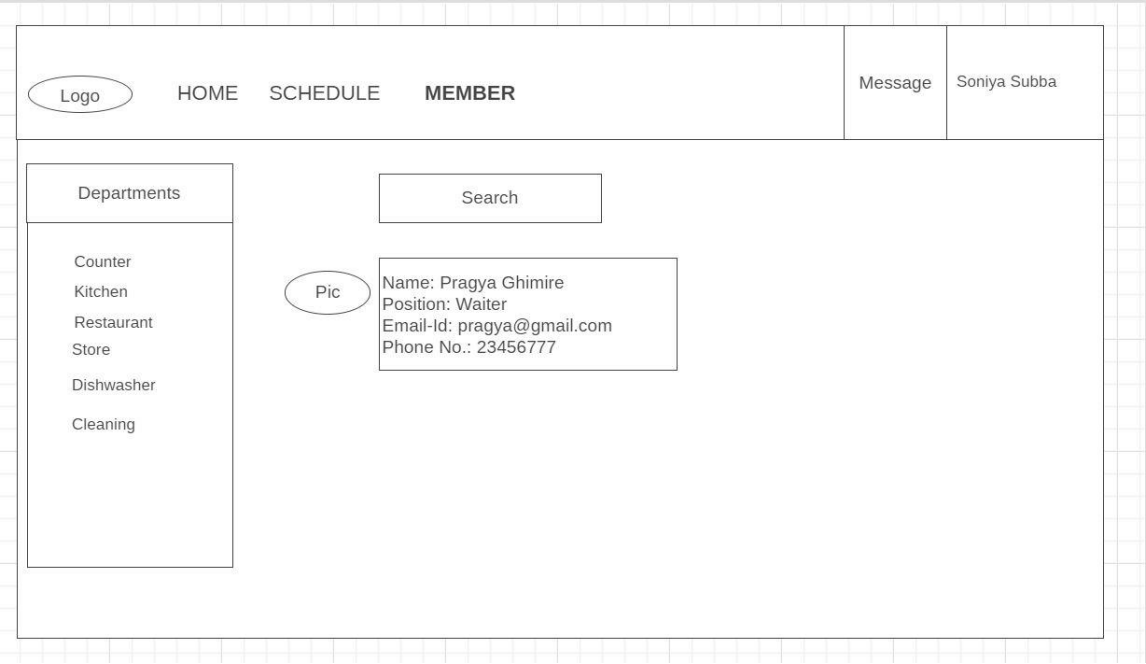
- Homepage:



- Schedule Page:



- Member page:

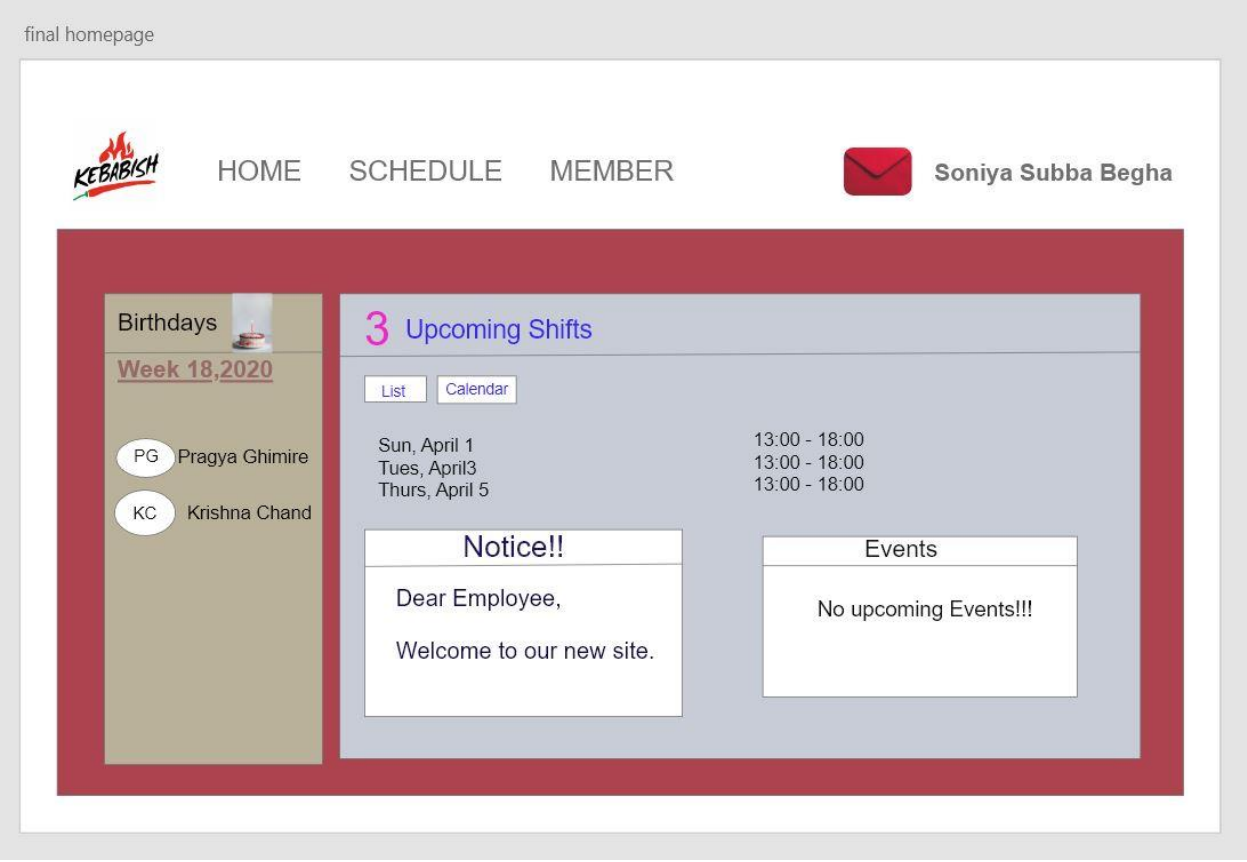


4.5.4 Mockups

Mockups are important and it used to give a visual design to the product and test it to the users to meet their expectations. So, the mockup is a visual design of any system or product that shows the appearance of the system. Shackel has measured the learnability by testing the mockup with 5 people. He proposes that by testing mockup we can identify the easiness of the system (Shackel, 2009). According to (Cao et al.,2016), the mockup of the system helps us to conclude regarding color, visual style, and typography. While developing mockups we can either make low-fidelity mockups that look like a real page, but it will not be interactive. It will not have clickable links whereas the high-fidelity mockup is functional, people can interact with the page and go to the next page. A high-fidelity mockup gives a look and feel of the ultimate product. So, according to the authors, the wireframe sets the foundation, mockup enhances the visual richness, and prototypes present the nearly last look of the product. In this manner, a mockup is between the wireframes and the prototypes. For our research, we have created low fidelity mockups using Adobe XD as an online tool.

This is the mockup of the major pages of the system that is designed considering our users, some of them are familiar with this kind of system and some of them are beginners. So, the system is made by keeping these things on the mind. This system has fewer features so that users would not feel any difficulties while using it. For now, they can log in and view their shifts, departments, and members of the restaurant.

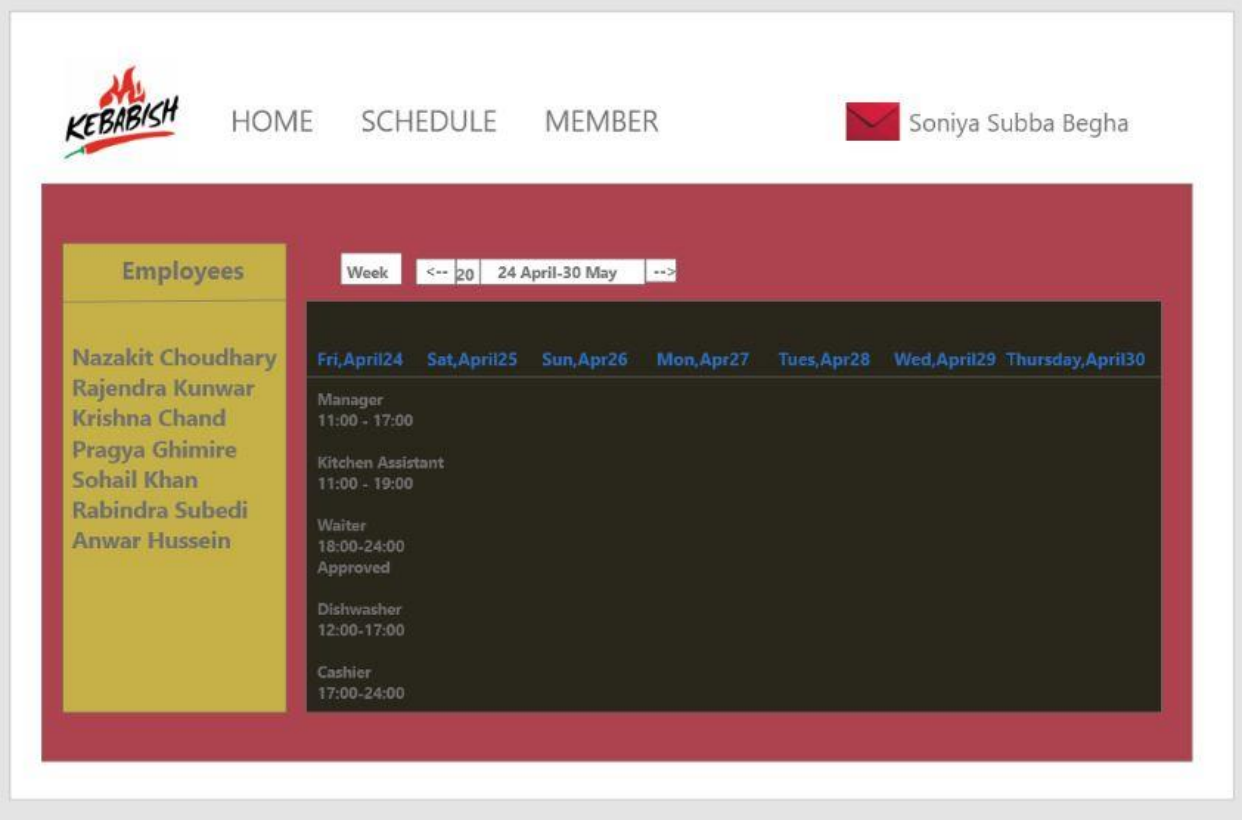
- Homepage:



When a user login in the system, then he or she lands on this page. On this page, he or she can view his or her shifts. A user can view the shifts in the list as well as in the calendar form. In the calendar view, a user can see his or her shift for a month. There is a section named ‘Birthdays’ in the left panel where there is a list of employees who have birthdays in the selected month. There is a ‘Notice’ section where the manager will publish news so that everyone could know about it. And there is another section called ‘Events’ where the company will post about the company events and trainings.

This system has two types of users, the manager as an administrator and the employees as users. As an administrator he has access to create, edit, update, delete members, departments, and the shifts. And for the employees, when they log in they can view their own shifts and others. There is a message section on the top on the right side where they can read the message and as well send messages to others. As a user, he or she can also edit his /her own information if there is a change in any detail like address or phone number.

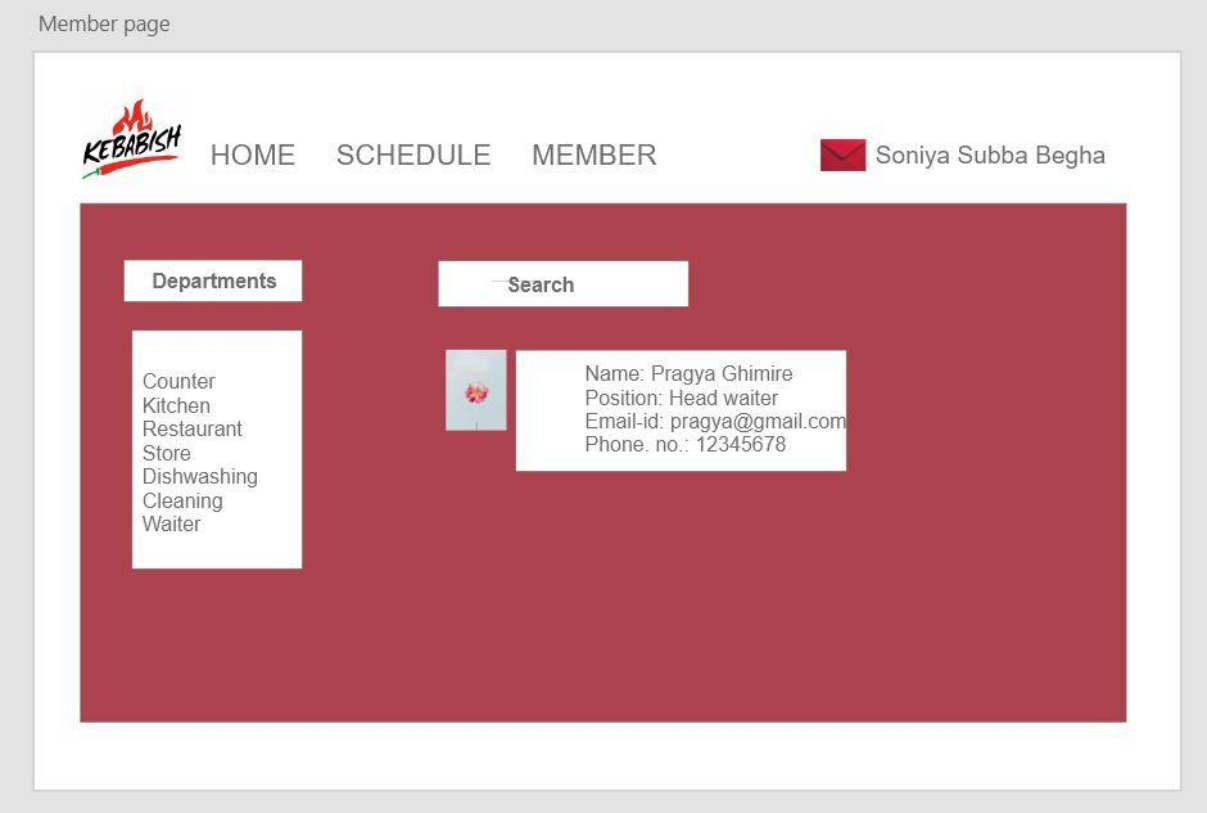
- Schedule Page:



On this page, we can see the schedule of all the departments with their working hours on that day. This page shows the work schedule for an entire week. And in the left panel, is the list of the employees who will be at work for this week. The manager updates the list of employees if there is a change in a schedule when someone is sick or wants a leave. And when the shift is completed, it is his job to approve it.

- Member page:

This is the page where we can see the list of the departments of a restaurant. When we click one department, we can see the list of the people of that specific department with their details (name, position, email-id, and phone number). Or we can also type the name of the person in a search box so we can get the information we want for example his or her email id or phone number. This makes it easy to contact the person when we are in need.



4.5.5 Prototypes

Sefelin et al. (2003) mentioned a prototype is simple and takes less time to develop it. It can be drawn horizontal or vertical and can be developed using pen and paper or other low- fidelity materials or by any user-friendly programming tool. The authors believe a low-fidelity prototyping is a picture of design ideas at very early phases of the designing process. According to ISO (2010), a prototype is an illustration of all or part of an interactive system that can be used for various purposes like analyzing, designing, and evaluating. Lim et al. (2008) suggested a framework to form a concept of prototypes. They discuss that the two primary characteristics of prototypes are that prototypes are filters that help designers by filtering the qualities on which the designer is concerned at a specific point in the designing process. So, the prototype serves as a filter which also supports designers to discover complicated design space. The areas where we can apply filtering are appearance, functionality, interactivity, etc. Another characteristic of a prototype is that it is a manifestation of design concepts. This means that to manifest a specific feature of the design, a designer needs to think about the scope of the prototype, prototype's

material, and decisions. According to Lim et al. (2008), the economic standard of prototyping is the simplest and most effective prototype that offers observable and accessible design ideas is the best prototype. Thus, we use the prototypes for different purposes like for understanding the users' needs, experiences, and beliefs, for evaluating and testing, for producing ideas and also for communication between designers.

Rudd et al. (1996) categorized the prototypes based on the improvement as low-fidelity or high-fidelity. According to the authors, low-fidelity prototypes represent design options, ideas, and screen outlines instead of depicting the functionality of the system in depth. So, building these types of prototypes does not take a long time since it provides incomplete or no functionality. The examples of these prototypes are storyboard presentations and proof-of-concept prototypes. Thus, these low-fidelity prototypes display the common look and impression of the interface rather than presenting how the system functions.

Chapter V: Discussion & Conclusion

In this section, we will summarize the results by answering our research questions which will reflect on the answer to the problem statement. The problem statement of this paper was to find out the solution for the employees of the restaurant where there is no proper system and how a new system can be designed with empathy. Different literature, theories, and approaches studied on this paper have made this research possible and these also provided me a wide knowledge of the importance of empathy and its related concepts in the user experience design process. Based on the literature review and different research methods applied for collecting the required information to perform this study, we could get the answers to the research question of this research. For the research question **RQ1: Who are the main users of the proposed system of Kebabish ApS?** We had identified there are other stakeholders like competitors, media, local residents, owners, suppliers besides the primary stakeholders. The primary stakeholders for this system are the manager and the employees. These stakeholders have a prime interest in the system and use this system in their daily work. To design the system, many theories, approaches, methodologies, and principles need to be studied and followed. And as the main investigating a subject of this paper was about empathy, we need to review multiple papers by scholars, experts in designing. After reviewing, studying, and applying some approaches, we came to realize that as all products and services are designed to the specified users, designers or researches must understand their users' needs and wants, to design the product or service as their expectations. And to have a better understanding of the user, empathy plays a significant role as it supports designers to be connected emotionally with their users. So, these studies and practices of data collection and analysis in this research helped us to get the answers to the research question **RQ2. What is the impact of empathy in the design process?** As we already knew and studied the value of empathy and the role of the designer in the design process, as a designer we have to know the traits or qualities that we need to be a more empathic designer. Based on the literature mentioned in this paper, to be an empathic designer, we should put ourselves in the place of our users. We should observe their attitudes during interviews, focus groups, and must identify and understand their requirements. When we are asking them to answer some questions, then we must let them speak more so we can explore those needs of them of which they are not also aware of. We must frequently communicate with our users to get feedback from them. As a result, we could design the product or the service that meets their expectations. This leads us to answer

to the research question **RQ3. What skills do a designer need to become a more empathic designer?**

Because of the pandemic situation, Covid-19, to collect the data from the stakeholders and to conduct the online meetings in this setting was not a simple task. Since the nation was in lockdown and everyone had to live inside the home with no contact with the outside world. Though there was a virtual connection to perform their specific task from the home, it was not easy for everyone. In my experience, this was the toughest time to carry out the research sitting just in front of the laptop and connecting with the required people through the help of social networking sites. During my interviews with the staff, they talked about the situations they were going through. Some of them have lost their job, and they became jobless in a brief time and some of them were worried about the consequences they have to bear because of this situation. Despite being in this situation, they took part in the online card sorting method and also in the interview to provide me their responses. Their supports made me realize that though they were under stress and in a critical condition, they did not hesitate to help me perform this study. Some of them could not take part in the data collection method because of this situation but still, they seemed interested in the beginning phase of my research. So, though they did not involve in the complete process, they still helped me to have their views to continue my research. Until the end of this paper, I could only finish the task of creating mockups of the system due to the situation and the time limitation for the submission of this research paper. Therefore, I would like to continue to work on the remaining tasks after the submission of this paper.

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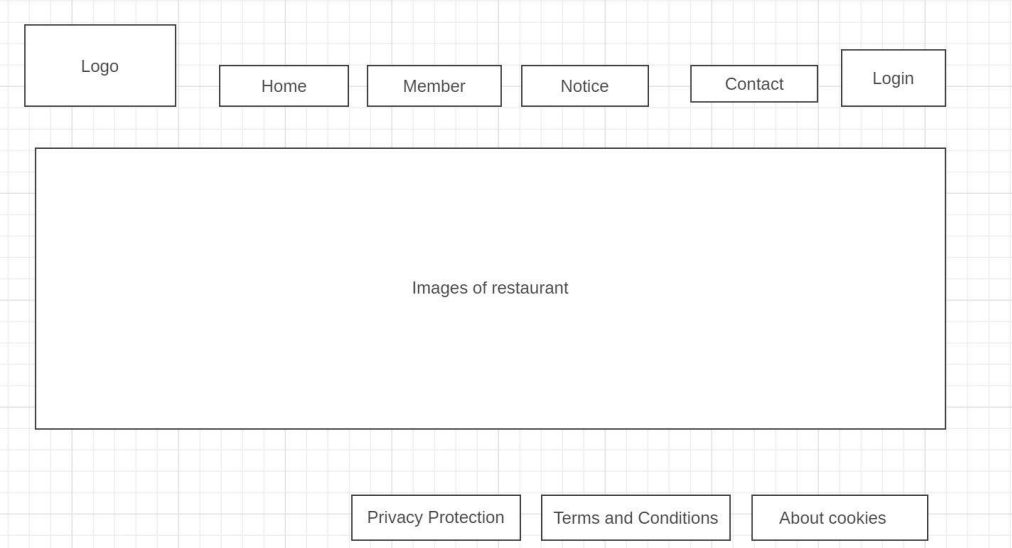
Appendix

1st draft of wireframes

Mainpage



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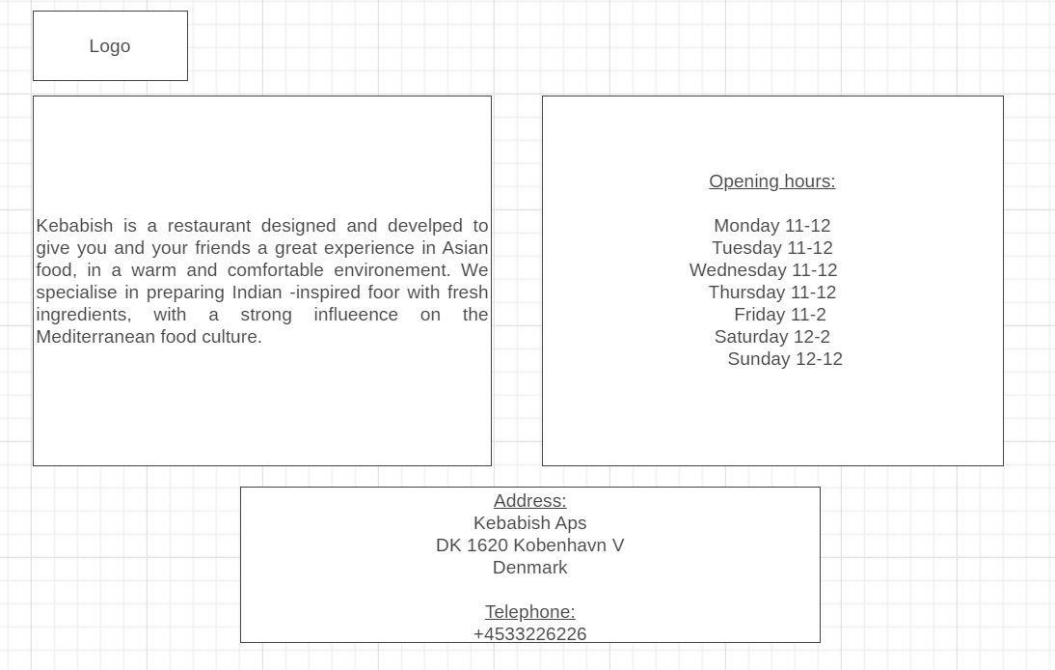
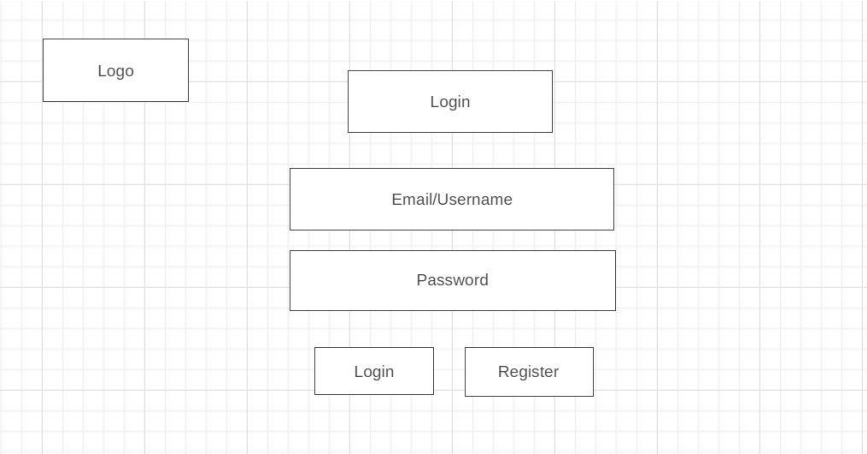
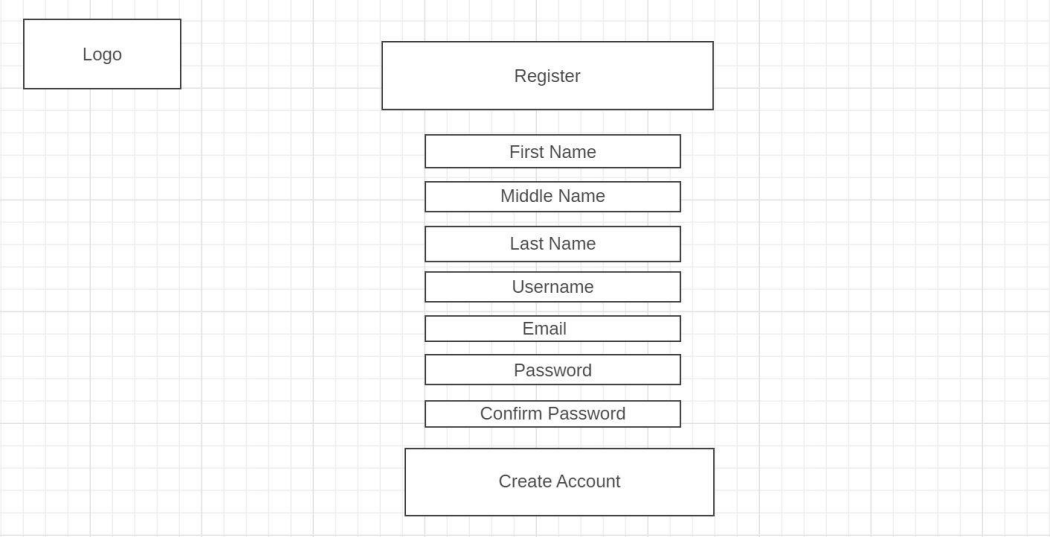


Login page



Register page



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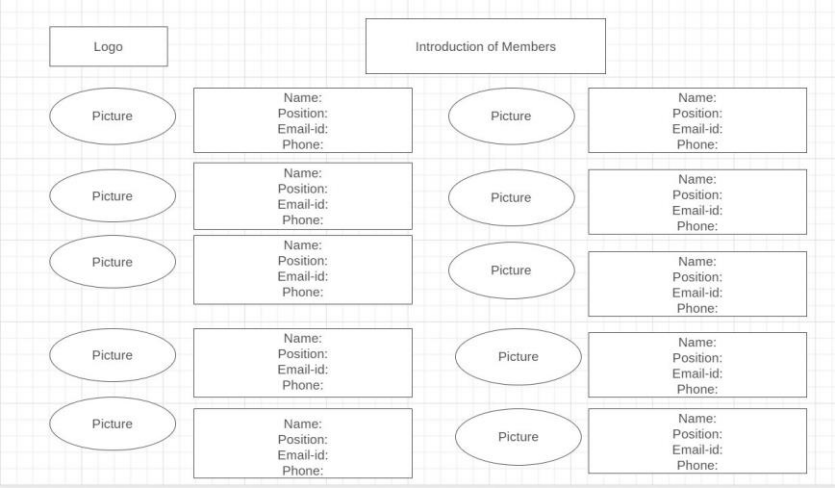
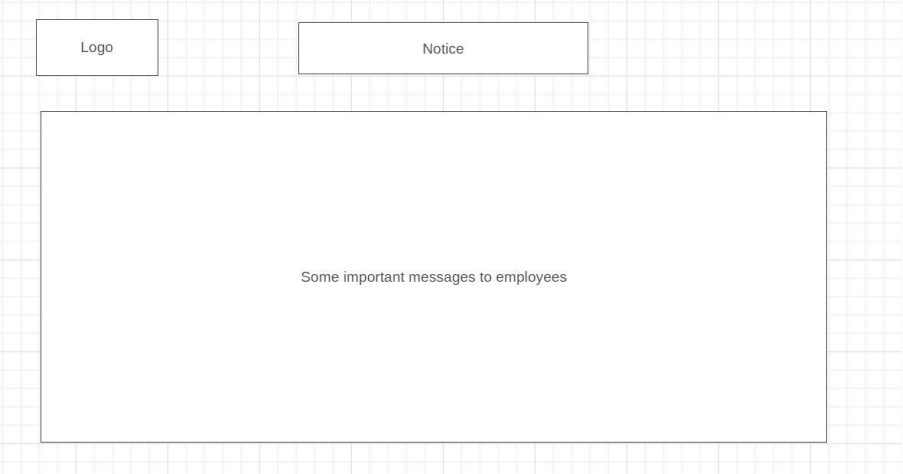
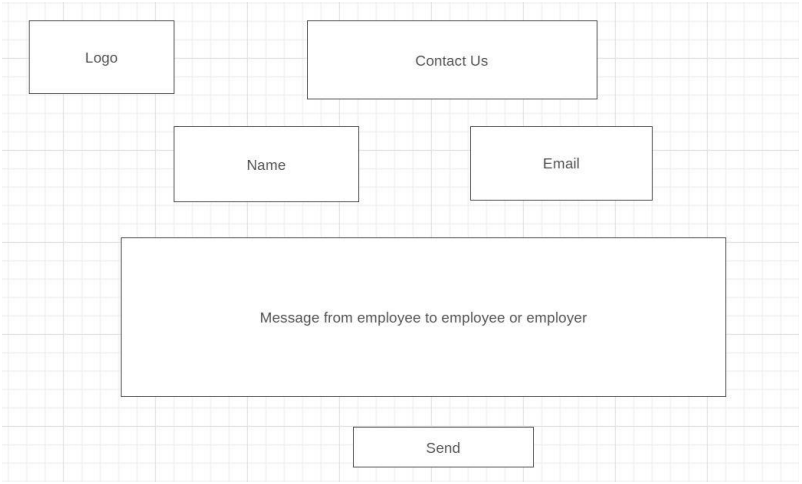


Notice Page



Contact page


Logo
Contact Us
Name
Email
Message from employee to employee or employer
Send