STORIES BENEATH NEEDLE

Understanding Ready Made Garment Workers of Bangladesh

Rahat Jahangir Rony, Kimia Tuz Zaman, Nova Ahmed

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In the Memory of MD. Saiful Islam

Senior Field Supervisor- CED, BRAC University

We mourn for him

Meet the Reaserchers

Photo: The Research Team Visiting Ashulia Garment Residents (Selfie from Gazi Fakhrul)

The qualitative study presented here was led by Dr. Nova Ahmed along with two full-time researchers Rahat Jahangir Rony and Kimia Tuz Zaman accompanied by researcher assistants as presented in Table1. The team has worked with women and their technology usage from the urban context in collaboration with Google [Sambasivan, 2018, Sambasivan, 2019], technology design for marginal women in the Rohingya refugee camps [Kimia, 2019] along with various other work focusing on technology design from developing country perspective. The current work has also been published in current outlets that are publicly available through open access [Ahmed, 2020].

Table. Participant Research Team

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We mentioned the names below who were associated with this project.

Management Committee

Matin Saad Abdullah, PhD, Associate Professor, Dept. of CSE & Senior Technology Advisor, CED-BRACU
Afshana Choudhury, Deputy Director, CED- BRACU
Syed Hasibuddin Hussain, Project Manager, CED-BRACU
Mynul Hasan, Field Coordinator, CED- BRACU
Faizul Islam, Research and M&E Associate, CED- BRACU
MD. Saiful Islam (Late), Senior Field Supervisor, CED- BRACU
Omar Faruk Fahim, Office Assistant, CED- BRACU

Assistance in Research

Atiqun Noor, North South University
Gazi Fakhrul Islam, AUST
Anik Saha, North South University

We also thank our family members, friends and others who constantly supported us during this project.

Anuva Chowdhury
Arisha Chowdhury
Gultekin Khan
Nurjahan Begam
Dr. Arshad Chowdhury &
Moin Bhuiyan
Md. Jahangir Hossain
Ranu Begum
Rifat Jahangir Ony
Md Maniruzzaman Miah
Sayda Sultana
Mostafa Kamal

Executive Summary

In Bangladesh, around 4 million garment workers are working in more than five thousand garment factories all around the country. Most of the factories are situated in Dhaka and Chittagong divisions in Bangladesh along with the membership of BGMEA (Bangladesh Garment Manufacturers and Exports Association) and BKMEA (Bangladesh Knitwear Manufacturers and Exports Association). Among these garments, there are compliant garments that follow the code of conduct of workers' rights, and the rest of them are non-compliant garments that often violate the code of conduct of workers' rights. In this particular scenario, workers' have different experiences in their workplaces, which has significant impacts on their lifestyle.

This study explores to understand garments workers' lifestyles briefly, through conducting qualitative interviews with 55 garment workers (32 workers were female and 23 workers were male) from 40 different garments in 6 different groups. In this report, we discuss the several areas of workers' life, which represent the scenarios of all garment workers, with the support of the literature review, and the analysis of quantitative and qualitative data. We identified the challenges and qualities of workers' daily life, and suggest a possible tool that might make their life easy and better.

We examine five keynote areas of workers' life as social connectivity, financial stability, technology integration, job environment, and healthcare. The notable findings are:

- The majority of the workers don't have a significant educational background; especially, female workers are lagging. These workers are migrated from low-income regions such as northern and southern regions of Bangladesh.

- Workers have very good social connections with neighbors, co-workers, house owners, shop keepers, and local mobile financing agents.

- Workers have a very low income, starting from BDT 8000/month (equivalent to USD 94.22) with numerous areas of expenses, including kids' education cost, monthly expenditures cost, house rent, etc. On the other hand, they struggle to save money on monthly basis with such expenses for lacking proper management of their salary where sometimes they make loans for expenses.

- The adaptation of technology usage is very less in proportion to the availability of technology. They all are familiar with and have access to both feature phones and smartphones, and usage of basic calling applications is common.

- Workers often struggle in getting a new job because of the traditional recruitment process. Apart from that, workers of non-compliant garments have several negative experiences while workers from compliant garments have very friendly and comfortable experiences in their workplaces.

- The majority of the workers are not aware of personal healthcare and they avoid spending money on visiting doctors during their illness.

To date, no such study explored these dimensions to understand the workers' life in a particular sector. This study comes up with a question that, do we able to support workers to get a better lifestyle? The findings of this report motivate us to suggest and design an easy user-friendly Bengali crowdsourcing platform that might reduce the basic daily complexities of the workers.

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STUDY DETAILS

1. INTRODUCTION

The Ready Made Garment sector is an important economic sector of earning revenues in Bangladesh [Mirdha, 2018, BGMEA, 2019, World Bank, 2019]. In this sector, around 90% of the workers are female [Islam 2016] and have great opportunities for employment. Sometimes this sector has been criticized for lacking awareness on workers' rights, and to improve qualities of lifestyle for workers. A few garments fail to ensure workers safety where two back to back accidents for Tazrin Fashions and Rana Plaza Tragedy are the perfect example for that [Karim, 2014, Manik,2013, Barua, 2017, Sinkovics, 2016, Bolle, 2014, Akhter, 2014, Islam,2016]. Such accidents showed a lack of negligence from respective factory authorities and raised awareness to ensure compliance based on internationally acceptable standards [Manik,2013, Barua, 2017, Sinkovics, 2016, Bolle, 2014, Akhter, 2014]. There have been significant improvements in the job environment after that in compliant garments by fulfilling the workers' rights and safety measures while non-compliant garments are still lagging. Workers' poor experiences in the workplace bring negative impacts on their lifestyle.

Garments workers are living in such areas, where close proximity is available [Ahmed, 2020]. Many families live on a single floor with some amount of shared space such as kitchen, washroom, etc. [Ahmed, 2020]. Through this study, we explored to garments workers living areas of both compliant and non-compliant garments in the Dhaka division to understand the qualities of their lifestyle and tried to come up with desirable interventions. We focused on workers' social connections, financial stability, technology usage scenarios, job environment, experiences, and healthcare. According to the workers' point of view, it is visible that the majority of the workers are illiterate, having low income including loans and expenses, facing job-related problems, less integrated with technologies, and have low centration on healthcare. However, workers from different garments and other community people have good social connections, sharing their feelings with others. From a brief understanding of their lifestyle, we suggest an easy to use mobile-based crowdsourcing platform at workers' end which helps the workers to overcome with the basic problems, and might bring a better lifestyle.

Figure 1: During Interview with Garment Workers

2. EXPLORING READY MADE GARMENTS (RMG)

2.1 RMG in Bangladesh

Bangladesh is successful in the RMG sector where Bangladesh was 2nd biggest apparel supplier in 2017 and earns around USD 29 Billion [Mirdha, 2018]. Bangladesh earned more than 10% of its national GDP and received around 84% of the foreign earnings in the single fiscal year of 2018-2019 [BGMEA, 2019, World Bank, 2019]. RMG increases the sector of employment massively and now one of the leading economic sectors in Bangladesh [Islam, 2020]. During 1983-84, there were 134 RMGs and 0.04 million workers, and in 2012-13 the growth is around 4 million workers worked in 5876 factories [Islam, 2020]. The RMG sector follows Lewis's economic growth model with an unbounded labor supply [Lewis, 1954].

2.2 The Growth of RMG with Women

The growth of RMG was easier in Bangladesh because of Low-cost labor [Islam, 2020]. On the other hand, the reputation was built-up by reducing the time between order placement and shipment of the product [Islam, 2020]. It makes workspace for unskilled or partially skilled people from rural regions of Bangladesh because of their low productivity in the agricultural sector [Islam, 2020]. Around 90% of the employees are women which helps the women to be empowered having their financial independence [Islam, 2016]. This employment space for women improves their position at home considering Bangladesh [Kabeer, 2011, Khosla, 2013, Schuler, 2013, Ahmed, 2014]. Women can support their families along with their husbands or other earning members through increasing investment in education for their family members [Hossain, 2012, Heath, 2012, Rahman, 2008, Ahmed, 2014].

2.3 Low Cost Workers

The wages of the workers are low by considering their longer duty hours at the factory [Berg, 2011]. Before 2018, the monthly wage at entry-level was BDT 5300 ($62.42), BDT 3000 ($35.33) was in 2010 and BDT 1662 ($19.57) was in 2006 [The Daily Star, 2020]. A study showed, when workers of Bangladesh received $0.06 per hour, at the same time per hour wages of $0.2 were in India and Pakistan, $0.3 was given in China and $0.78 was given in Thailand [Kurpad, 2014, Alam, 2017]. The government of Bangladesh took the initiative to increase the monthly salary of the workers in 2018 where it is increased around 51% and set to BDT 8000 ($94.22) per month at the entry-level for around 4 million workers [Kurpad, 2014]

2.4 Some Unpredictable Incidents

In 2012, there died around 112 garments workers in Tazreen Fashion fire incidents [ILO, 2020] and the most divesting incident was in 2013, where a garment factory, Rana Plaza, collapsed during working time and around 1134 workers died and more than 2500 were permanently injured [Karim, 2014]. These two incidents raised questions regarding workers safety and rights.

2.5 Violation of Ethical Codes

Workers had poor safety records and violations where compliance with international standard codes was not properly followed [Ahamed, 2012, Clean Cloth Campaign, 2012, Ansary, 2015]. It was found that most of the female garments workers often face verbal and physical abuse [Sadika, 2019]. Sometimes workers have to do overtime and work more than 10 hours a day in many cases which affect worker's personal life [Sadika, 2019, Akhter, 2017, Carbo, 2010]. These were the violation of ethical codes. There were several incidents in the RMG sector, and the reasons behind the incidents were authorities less concentration on workers' safety and rights, and not following the ethical codes [Karim, 2014]. After the massive incidents, Bangladesh RMG sector focused on improving the workers' safety and rights to maintain the global standards for continuing global buyers' orders [Ansary, 2015].

2.6 Trade Unions

Trade unions can play an important role in establishing workers' rights. Nur et al. recommended that trade unions might be helpful for both workers and employers where workers can raise their voices in beneficial ways regarding their rights [Nur, 2019]. They are following some own set of rules where they deal with workers and employers, more specifically trade unions of workers discuss workers' rights, wages, working hours, safety, working conditions, etc. [Nur, 2019]. The establishment of trade unions was challenging in Bangladesh only because of the complexities of regulations and employers of the garments often easily violate workers' rights [Nur, 2019]. On the other hand, the majority of the workers are women and they are suffering mostly for establishing their rights. Usually, trade unions are dominated by males from the previous and they often neglect some issues for women such as, child care, harassment, safe transportation, working late at night, etc. [Kabeer, 2004]. Recently a few trade unions have woman's wings [Kabeer, 2004, Khosla, 2009]. In recent years, female workers are in EPZ factories are more aware of their rights [Khosla, 2009].

2.7 Agreement

To satisfy the global buyers', the Government of Bangladesh, RMG workers and RMG employers came under the agreement NTPA (National Tripartite Plan of Action) in 2013 [ILO, 2020]. Based on this agreement GoB, EU and ILO issued "The Sustainability Compact: Compact for Continuous Improvements in Labor Rights and Factory Safety in the Ready-Made Garment and Knitwear Industry in Bangladesh" in 2013 which is working to improve workers' rights and standards [Ansary et al., 2015, ILO, 2020, Joint Statement, 2013].

In recent years, the situation is getting better with the support of it.

Agreement: "The Sustainability Compact: Compact for Continuous Improvements in Labor Rights and Factory Safety in the ReadyMade Garment and Knitwear Industry in Bangladesh"

3. AREA OF THE STUDY

We went to three different areas in the Dhaka division for our study. We explored Mirpur, Ashulia, and Gazipur for this study as graphically presented in figure 2(a, b, c, and d). Most of the garment factories are situated in these areas.

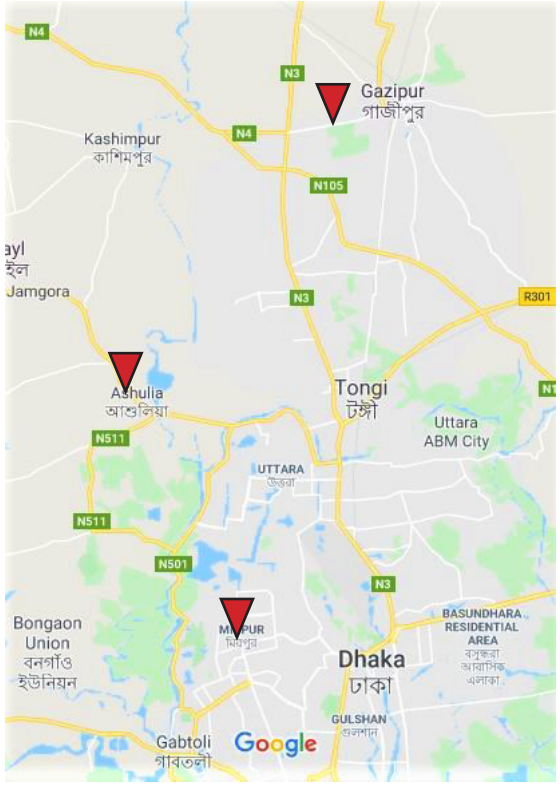


Figure 2(a). Explored Garment Areas in Google map

3.1 Mirpur

Mirpur (established 1962) is an Upzilla (Thana) and urban area, situated in the north-east of Dhaka city inside Dhaka District with an area of 58.66 km2. The population in Mirpur is around 1,074,232 according to 2007 data. The ratio of the male and female population is 54.15% and 45.85% respectively [Mirpur 2020, Wikipedia]. We take this area as FGD Area 1, where we conducted discussions for Group 1 and 2 as shown in Table 1.

Figure 2(b). Area of qualitative study- Mirpur

Table 1. Garments Worker Details from Mirpur Area

FGD Area	Group	Participant Count	Gender	Age Range	Factory Count
FGD Area 1 Mirpur Dhaka	Group 1	11	F	22 - 38	9
	Group 2	7	M	25 - 40	7

3.2 Ashulia

Ashulia is a suburban area of Dhaka District, but not established as an Upzilla (Thana). The growth of urbanization is so raided here where most of the areas are owned by the garment factories [Ashulia 2020, Wikipedia]. We take Ashulia as FGD Area 2, and we conducted discussions for Group 3 and 4 there (Table 2).

Figure 2(c). Area of qualitative study- Ashulia

Table 2. Garments Worker Details from Ashulia Area

FGD Area	Group	Participant Count	Gender	Age Range	Factory Count
FGD Area 2 Ashulia Dhaka	Group 3	12	F	20 - 30	3
	Group 4	8	M	18 - 30	7

3.3 Gazipur

Gazipur is an individual district and urban area situated in the northern part of Dhaka Division having the area of 1741.53 km2. The total population of this district is around 3,403,912 where 52.52% are male and 47.48% are female [Gazipur 2020, Wikipedia]. Gazipur is our FGD Area 3, where we conducted discussions for Group 5 and 6 (Table 3).

Figure 2(d). Area of qualitative study- Gazipur

Table 3. Garments Worker Details from Gazipur Area

FGD Area	Group	Participant Count	Gender	Age Range	Factory Count
FGD Area 3 Gazipur	Group 5	9	F	18 - 30	7
	Group 6	8	M	18 - 30	7

4. METHOD OF THE QUALITATIVE STUDY

We conducted qualitative studies among garment workers with 6 focus groups in semi-structured format. We focused on a qualitative study as we wanted to experience and understand their lifestyle, job life, and challenges in their livelihood of the workers from their views. Each session took around 2 hours. Three lead researchers and three research associates conducted each discussion. These studies took place during January and February in 2020.

4.1 Focused Garments

In Bangladesh, the garment factories are concentrated into two such types as Compliant and Non- Compliant factories wherein compliant factories make sure all the labor rights and facilities according to the international buyer code of conduct maintain the labor law strictly [Baral, 2010]. On the other hand, non- compliant factories don't have a practice of any strict policies to ensure labor rights [Baral, 2010]. We explored the workers from both Compliant and Non- Compliant factories to understand the differences in the workplace between them.

4.2 Recruitment of the Participants

To reach out to these workers, first, we communicated with some local communicators such as workers' house owners and house managers with the help of CED, BRAC University, Bangladesh.

The team from CED, BRAC University contacted the communicators who are acquaintance to many workers inside the community as they have to communicate with a lot of workers frequently regarding house rent purposes. Our communicators talked with the basic level workers (Helper, operator, etc.) from different garments for our research purposes. Our prime requirement was to get workers from both Compliant and Non- Compliant factories to get a clear picture of discriminations between these two types.

4.3 Interview Place

We went to the communicators' place where the recruited participants joined for the interview. We considered the place, so that workers would feel comfortable and unrestrained in expressing their opinions.

4.4 Forming FGD

Our total sample size was n = 55 where workers' age range was 18-40 years and they were from 40 different garments. We conducted qualitative studies by forming focus groups of a maximum of 12 workers at a time. Here we interviewed male and female workers separately in each area. We wanted to form small groups, but it was difficult for the workers due to their time constraints. Details of the focus groups are given in Table 4 in the following page, where we have presented participant counts, gender, area, and factories count.

4.5 FGD Study Design

Our discussion was open ended and focused on understanding the participant's personal life, social aspects, and lastly the day to day experiences in their workplaces. First, we asked the participants about their personal life, family, and relationships with family

Table 4. Details of the Focus Groups

FGD Area	Group	Participant Count	Gender	Age Range	Factory Count
FGD Area 1 (Mirpur, Dhaka)	Group 1	11	F	22-38	9
	Group 2	7	M	25-40	7
FGD Area 2 (Ashulia, Dhaka)	Group 3	12	F	20-30	3
	Group 4	8	M	18-30	7
FGD Area 3 (Gazipur)	Group 5	9	F	18-40	7
	Group 6	8	M	18-40	7

members and friends, source of entertainment, health issues and reliability regarding children. We also ask them about their financial stability. Then we moved to understand their social connectivity with landlords, neighbors, and any other personalities such as grocery sellers, mobile finance service agents around them. Finally, we asked them about their daily work policy, workload, work environment, relationship with co-workers, seniors, etc.

4.6 Study Moderation and Analysis

For FGDs, a total of 12 hours of fieldwork was done. Three lead researchers have moderated all the interviews with follow up questions and the other three research associates took notes of the interviews. Lead researchers also moderated the study analysis. All our interviews were done in the native Bengali language. We recorded the audio voices of the FGDs. Around 12 hours of audio records have been transcribed into English during study analysis. We followed the inductive content analysis method to find out the important responses from the discussions [Braun et al., 2006, Elo et al., 2008]. The transcripts were openly coded by the researchers together during inductive content analysis. Then the codebook was thoroughly reviewed by all the researchers during the analysis phase and come up with keynote findings.

4.7 Research Ethics and Incentives

The research work was conducted from an academic perspective and supported under the institutional review board (IRB), and requires the informed consent of the participating workers. All the participants were adults and gave consent to participate in the study. Our strategies, policies, and permissions were discussed verbally with the workers in the native language before starting the discussion for transparency. We also responded to all the questions that were asked by the participants. It was mentioned that participants had the right to skip any questions or to stop the discussions at any point if they are not comfortable with the environment without forfeiting the incentives. We also do not have the right to disclose participants' identities as per consent. All our collected recordings, notes and data are secured and stored in a private drive with full access to the researchers only.

We provided some snacks and daily grocery items worth of BDT 200 (USD 2.4) along with BDT 300 (USD 3.5) to each participant as incentives. Each local communicator who helped to recruit participants and organized the studies were given the same snacks and daily grocery items along with BDT 1000 (USD 11.5) for his extra fieldwork for communicating with the workers.

STUDY OUTCOME

5. DEMOGRAPHIC SKETCH

We have explored n=55 garments workers from three different regions in the Dhaka division. During our every single FGD, we explored their basic demographic features from which we quantitatively understood them. We collected their data regarding their age groups, education level, marital status, technology integration scenarios, savings, and job types and experience. Most of the information we divided into area basis between female and male workers for the understanding among genders. We discuss their basic demographic features in the following sub-sections (Tables are in Appendix).

5.1 Age Groups

We divided the workers into three age groups based on our findings in the study, where their minimum age was 18 and the maximum age was 40. The three age groups are:

- Age (18-20)
- Age (21-30)
- Age (31-40)

It is noted in the following figure 3 that the majority of the workers were in 21-30 age groups. Among 55 workers 34 workers (23 female and 11 male) of them were in this age group which was more than half of the total workers. This area of age group is highly active in the garments sectors where all the workers mentioned that majority of their co-workers are in-between age 30.

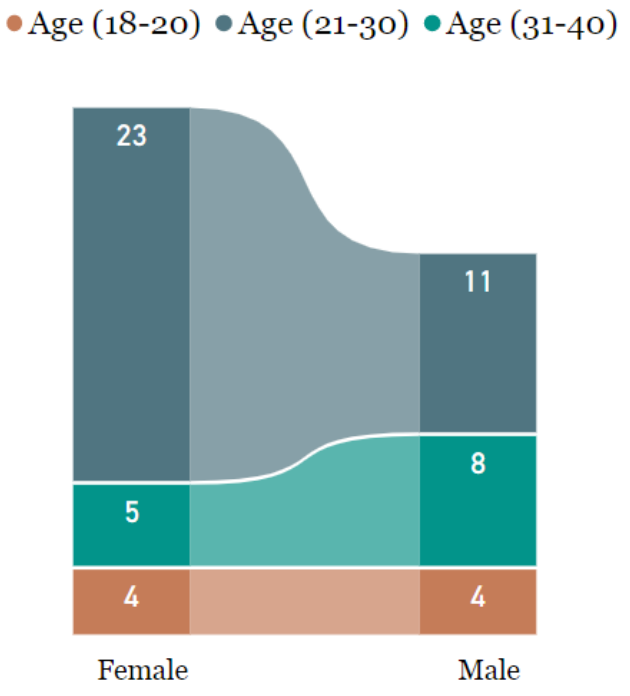


Figure 3: Age Range of the Garments Workers

5.2 Education and Marital Status

This community has a low education level on a large scale. The scenarios are similar for both male and female workers. Again, workers get married at a certain stage that they have to maintain the responsibility of their families. The following figures 4 and 5 represent their education and marital status according to their age groups on the area basis.

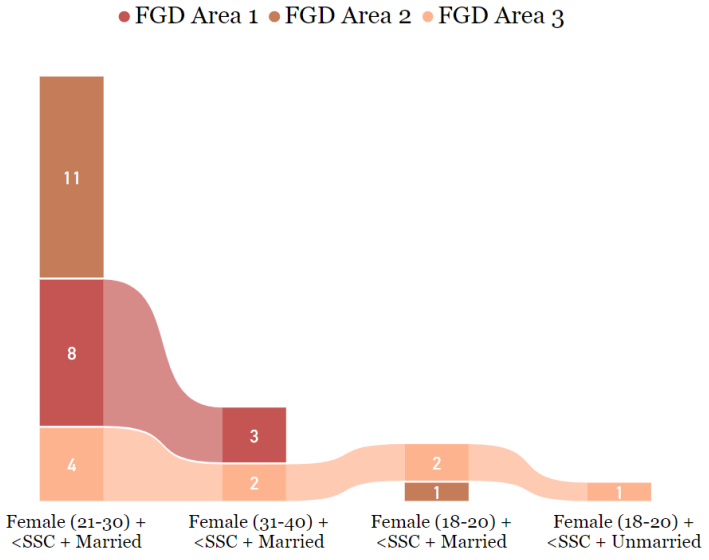


Figure 4: Education and Marital Status of Female Workers.

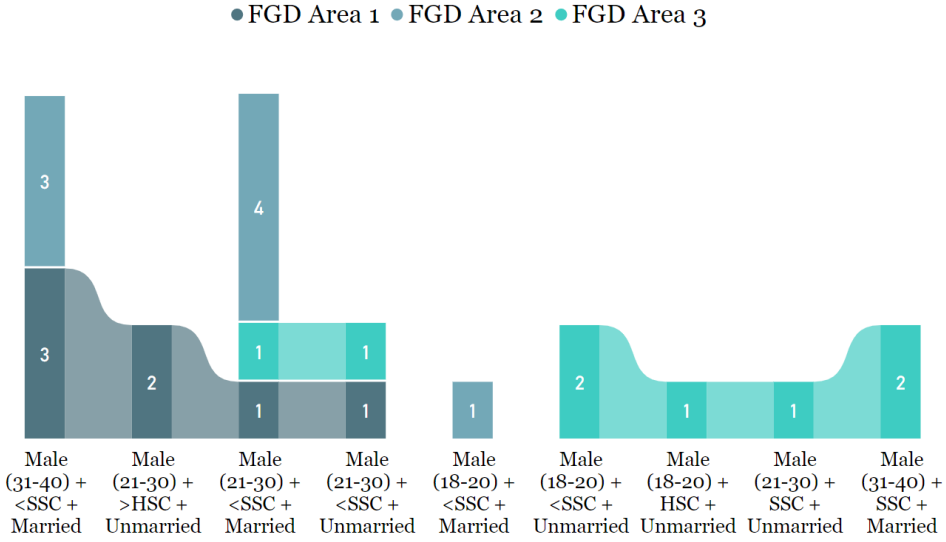


Figure 5: Education and Marital Status of Male Workers.

In figure 5, we have seen that all female workers' education level was below SSC (Secondary school certificate). In each area, the marital status level was higher for the 21-30 age group. Only one female worker from FGD Area 3 at 18-20 age group was unmarried among 32 female workers, accordingly others at the same age range were married. However, the low literacy rate among male workers was visible, but there had much variety than females. In figure 6, the majority of the male workers' education level was below SSC, a few workers were up to SSC, and there were 3 male workers in different FGD areas who had educational qualification up to HSC or more than HSC (Higher-Secondary School Certificate). These workers were unmarried. We also found that around 6 male workers among 23 workers were unmarried. Throughout the findings for both female and male workers, it is notable that their education level and marital status do not have much effect on their job site where only male workers had a much better education level than female workers.

5.3 Technology

Technology integration is very less among these community and their ways of usage are very simple. Figure 6 gives us insight into their smartphone ownership, usage, and internet facilities among the workers. Only 15 female workers out of 32 own a smartphone where 13 male workers out of 23 own a smartphone. It gives an understanding that female workers lave less ownership to a smartphone. Apart from that around 12 female and 8 male workers had the facility to use Wi-Fi internet in their living areas, provided by their house owners. Here, female workers fall behind in the sense of smartphone and internet usage. Around 9 female workers continuously use both smartphones and the internet where male workers have a higher usage rate in such circumstances. As male workers had fewer internet facilities, sometimes they use mobile internet data packs. Workers mostly use calling apps, and a few of them have social media accounts, other than that they do not explore any other sites. This overall scenario reveals that female workers are less integrated with mobile technology.

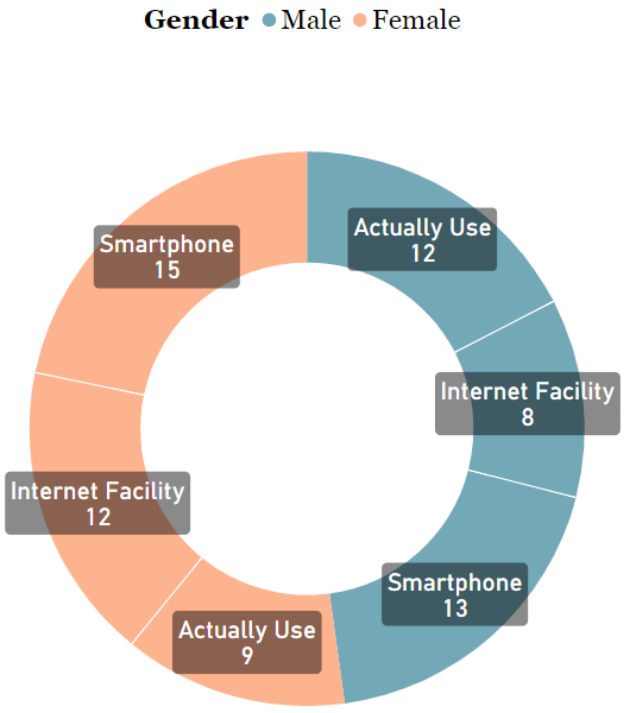


Figure 6: Ownership of Smartphone, Internet Facilities, and Actual Usage of both Smartphone and Internet Status among the Workers

Figure 7 and Fiure 8 are the breakdown of their usage on areas and age groups basis which gives us a clear picture of their technology usage. Figure 8 comes up with the scenarios of female workers, and it is identified that smartphone and internet usage is significantly visible only in the 21-30 age group. The alternate scenarios show that the female workers of this age range suffer a lack of smartphone ownership and internet usage. The distribution scenarios of mobile technology usage between FGD Area 1 and FGD Area 2 is similar. Figure 9 shows the breakdown for male workers, and on average in all areas, they have better scenarios of using a smartphone than female workers. Male workers in FGD area 3 had more involvement in smartphone and internet usage. It is significant between male and female workers that female workers of age group 21-30 only use the internet, whereas male workers of all ranges had the access and connections in both smartphones and the internet.

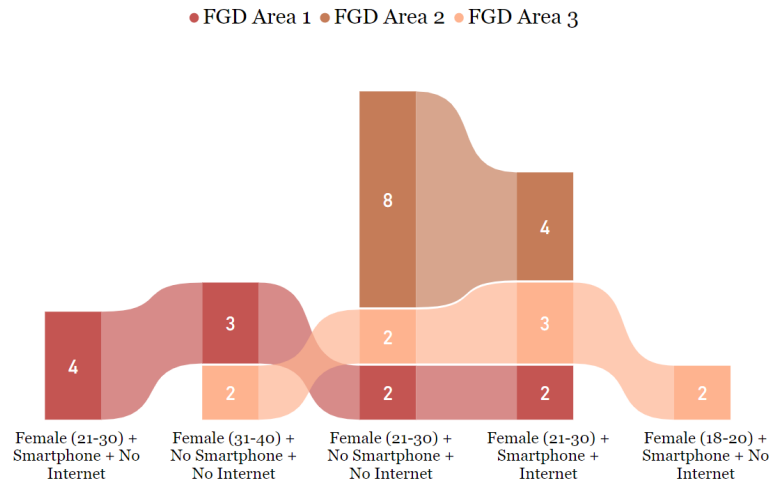


Figure 7: Breakdown of the Smartphone and Internet Facilities and usage Status of Female Workers according to age and area basis

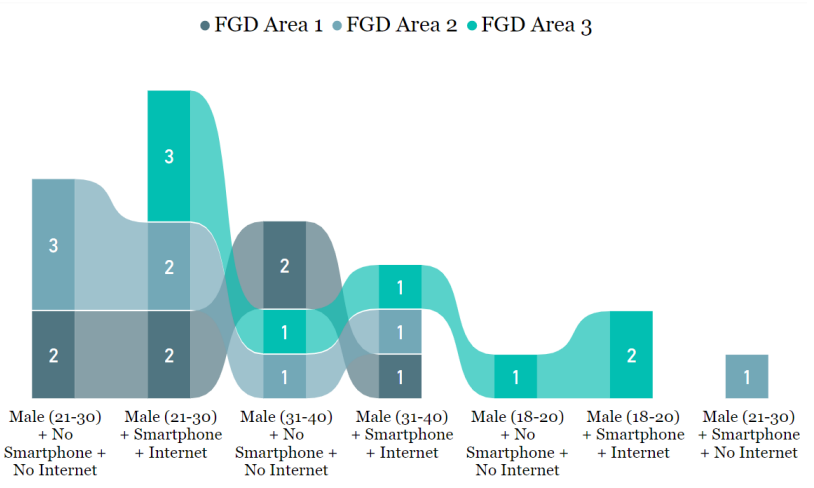


Figure 8: Breakdown of the Smartphone and Internet Facilities and usage Status of Male Workers according to Age and Area basis

5.4 Migration for Jobs and Experiences

All our study conducted in the Dhaka division, only because the maximum number of garments factories are located in this division as we have mentioned in the area of the study section. The workers of these garments are not local, all of them were migrated from different regions to these areas only for the job purpose. In Bangladesh, northern regions are comparatively poor areas because the people of this region suffer from a heavy drought and river erosion every year. Poor and lower-income people move from this region to another region in search of work. On the other hand, the southern regions here are the coastal areas where every year tropical cyclones and other natural disasters hit these areas and cause great damage to the crops and cattle. Apart from that, these areas suffer from a poor transportation system. Due to these problems, lower-income people tend to move from this region. In figure 10, we have shown that around 36 workers in our study were coming from the northern regions of Bangladesh and the rest of the 19 workers were migrated from southern regions of Bangladesh.

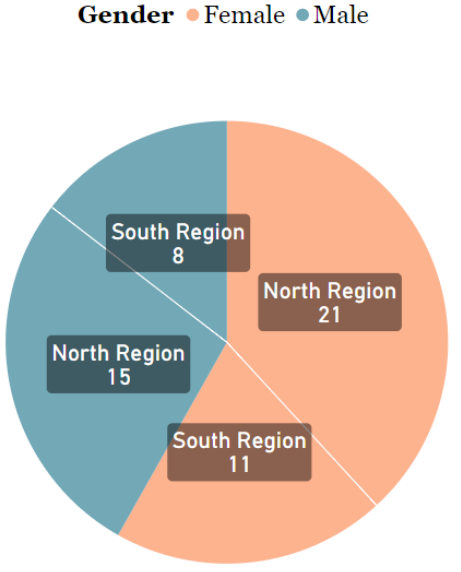


Figure 9: Picture of the Workers Migration

These workers worked in both compliant and non-compliant garments as we have mentioned in our method that we conducted our discussions with them. Non-compliant garments do not follow the global standard of workers' rights and regulations that is why workers from non-compliant garments have faced negative experiences in their job sector. Here, negative experiences dealing with challenges in jobs, verbal/physical harassment, excessive workloads, etc. On the other hand, positive experiences are, workers have a nice and friendly environment in their workplaces. In our study, we found that many of our workers already have faced several negative experiences.

The following figures of 10 and 11 show the job scenarios for both female and male workers respectively. Among 32 female workers, 25 females were working in non-compliant garments, and they all have negative experiences. Again, the scenario of experience is completely similar for male workers, where 13 workers out of 23 workers were working in the non-compliant garments and they all suffered from negative experiences. In these circumstances, age groups of the workers did not come up with any significant changes. It is clear and common from these two figures that all workers from compliant garments have positive experiences and all workers from non-compliant garments have negative experiences.

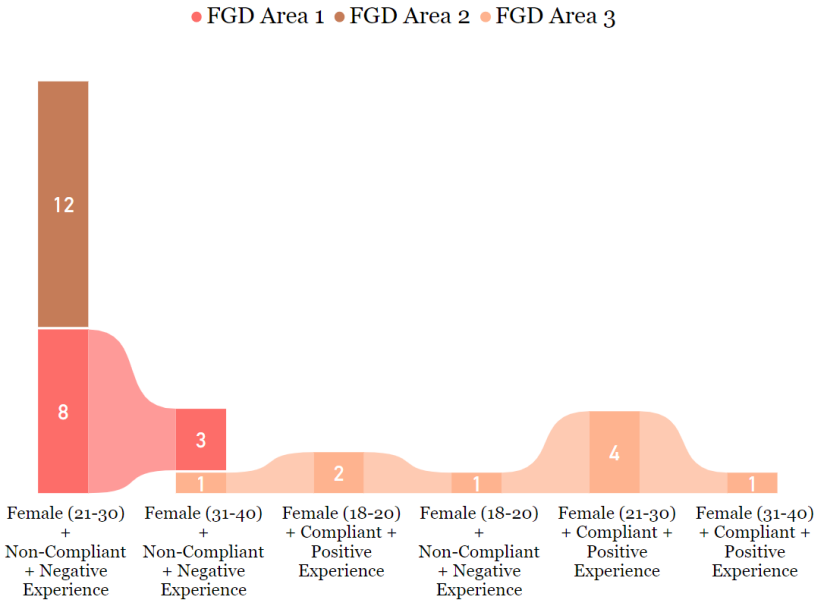


Figure 10: Breakdown of the Job experience of the Female Workers according to Age, Garments type and Area basis

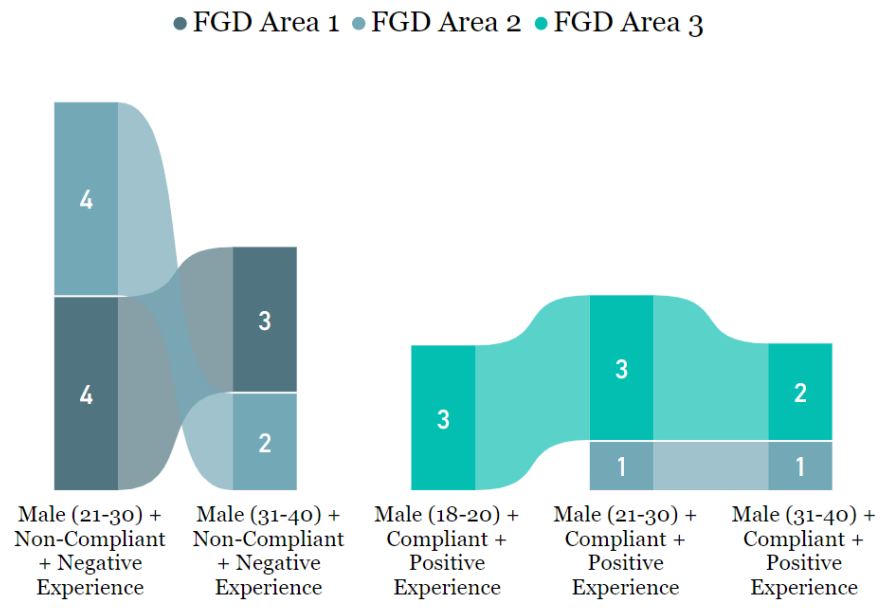


Figure 11: Breakdown of the Job experience of the Male Workers according to Age, Garments type and Area basis

5.5 Savings

The garments workers have a limited income every month, where savings sometimes is difficult for them. They have diversities of expenses including house rent, monthly groceries, kids' education costs, etc. In our study, we have seen that the majority of the workers do not have savings only because of expenses. We tried to analyze their savings scenarios through their garments type they enrolled in. We found the mixed scenarios here. They always not use the back account for saving money, sometimes they use Mobile Financing Services (MFS) as their savings account. We also understood that most of the workers suffer from loans from different areas due to low income, and expenses which is another reason for no savings.

Figures 12 and 13 show the scenarios of savings among female and male workers respectively. Most of the female workers do not have savings. Here a few female workers of 21-30 age group from non-compliant and compliant garments had savings, which are very less among all female workers. However, the scenario is quite different for male workers, where around half of them had savings. These male workers were from both compliant and non-compliant garments, and it is noted that age groups did not create any differences here, but workers from compliant garments were more aware of savings. As we understand, lack of savings bring uncertainties in workers' futures.

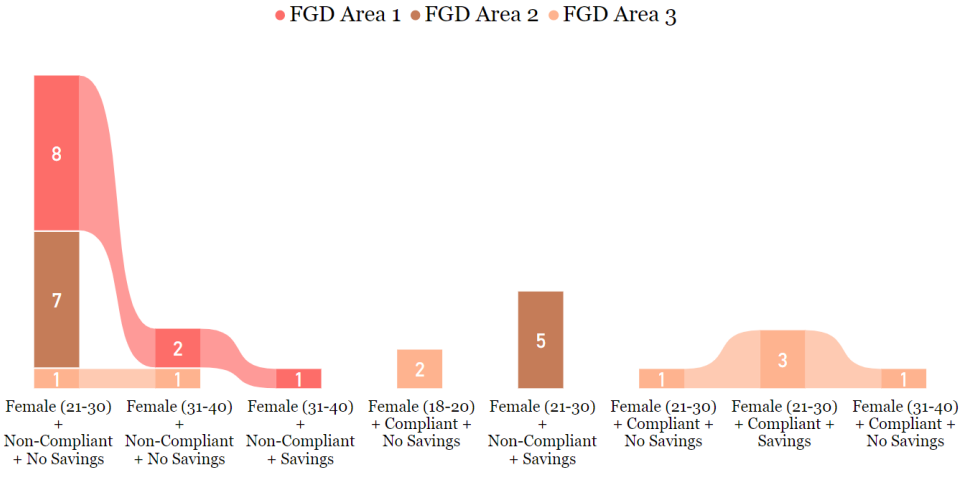


Figure 12: Breakdown of the Savings Scenarios of the Female Workers according to Age, Garments type and Area basis

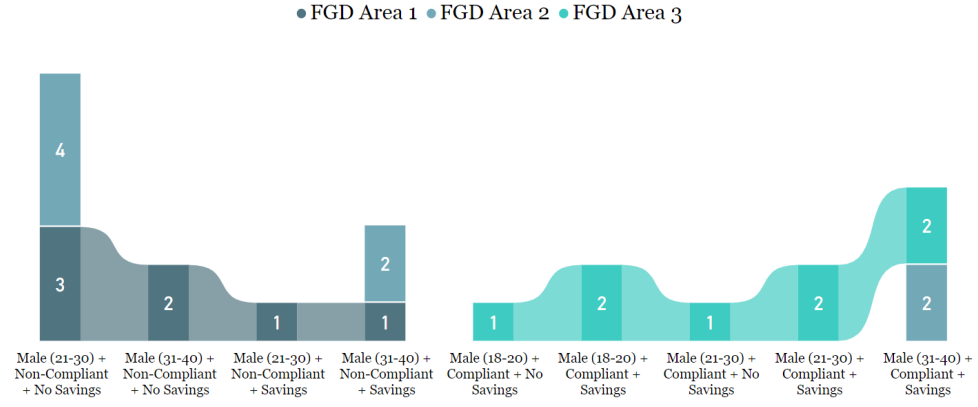


Figure 13: Breakdown of the Savings Scenarios of the Male Workers according to Age, Garments type and Area basis.

6. UNDERSTANDING IN BRIEF

6.1 How Social Connectivity Improves Workers' Lifestyle?

Social connectivity is such a thing that has a great impact on someone's lifestyle in society. A good relationship with the community people brings wellbeing in daily life. In our study, we explored garments workers' lifestyle and tried to understand their social connectivity. Garments workers live in a society where all their neighbors are the garments workers and the associated people (e.g.: senior officers) with garments factories. They have very good relationships within communities (e.g.: house owners, banking agents, etc.). Most of the workers are connected with a positive relationship where they always try to help each other. The first and foremost thing is workers have a very good understanding of families. In the majority of the families both husband and wife either work in the same garment factory or different factories. Sometimes, husbands enrolled in different jobs where their incomes are similar to wives' income at factories. That is why they both co-operate with each other and maintain the family throughout the month. Apart from that, the workers' community lives in specific areas where their quality of works is the same and they also work in nearby factories. At the end of the day, they can share their feelings. Generally, in every garment minimum, thousands of workers work together. These workers maintain a good relationship between them, working in a line to continue the production processes. Some of them considered each other as brothers. Eventually, in compliant garments workers have a good relationship with senior-level officers (e.g.: supervisors, line chiefs, floor in-charge, etc.) and sometimes with the factory owners which initiate a good social environment. A female worker from a compliant garment explained to us they have full access to talk with senior officers.

"We have a good relationship between workers, supervisors and admin ma'am. We can easily talk to her. Sometimes, the owner of the garment comes to the floor and make a meeting with workers"

– Female Worker, Gazipur

Relationship with house owners brings a significant impact on workers' lifestyles. Workers live in such a place where around 6-8 families live in a single floor of a building. The rent of each room is around BDT 3000-4000 that varies depending on areas. Sometimes, workers cannot pay house rent timely mostly due to late salaries or other expenses. Most of their house owners are friendly to them, allowing them proper time to pay the rent and understand their sufferings. However, a few of our workers faced problems with their house owners regarding the rapid increment of house rent, but all over workers have a good relationship with their house owners. A female worker expressed as:

"We have a good relationship with house owners. They do not create pressure on us. They know the situation. For example, if I do not pay the rent for 3 months. He will say nothing."

- Female worker, Gazipur.

Workers usually use Mobile Financing Services (MFS) to transfer money to their hometown. MFS agents are working local area basis who helps anyone to use agent MFS account for the transaction and the transfer of the money. In such scenarios, no one needs a personal account. The workers who don't have MFS, they always go to known local agents because they trust them. Workers also have a good relationship with them, only because they get support anytime from the MFS agents.

"I think our local agents are trusted. We know them. They never do anything wrong. I do not send money from my number. When I am in front of the agent, I just give the money and receivers no. to him. Then the agent calls the receiver to verify it and I give the money to the agent and he sends it."

– Female Worker, Mirpur

These good and strong social connectivity brings safety in their community. There is no chaos, harassment, and abuse in their living areas. Women in developing nations have harassment and abuse records on roads whereas this community women feel safe in their society. Workers naturally move together to their workplaces and living places. From the workers' point of view, community people day by day improve women's safety on outside, even they also feel safe walking around at midnight. Thus, socially these workers are staying in a strong relationship territory that improves and reduce their difficulties in lifestyle.

6.2 How Workers Manage their Finance?

This community is one of the low-income groups in Bangladesh where their basic salary starts from BDT 8000 as their new salary scale from 2018. They get their salaries in different ways but workers face difficulties in saving money for several expenses and loans. Very recently many workers get their salaries through BKASH, which is the largest MFS platform in Bangladesh. Most of these workers have separate BKASH personal accounts even between husband and wife. Apart from that, some garments giving salaries through banks that help the workers in the sense that workers can manage their salaries through Debit Cards from both banks and booths. Initially, garments provided salary through pay slips. Workers informed that authorities of all garments move gradually to banks or MFS methods. However, the problems begin with salary management. Garments workers have minimum scopes of savings monthly with their low earnings along with their several areas of expenses. Many workers go through several loans and a few workers can save money on accounts. The majority portion of their salaries ends up with house rent and their kids' education purposes. All workers prioritize investing in their kids. This scenario is similar in every family.

"We cannot manage our family with this salary. Salary ends up with House rent, kids' education cost, monthly expense, grocery shopping, etc. sometimes we make a loan."

– Female Worker, Mirpur.

These workers also owe their daily necessaries from local shops. They pay the bill at the end of the months after getting their salaries. Shopkeepers sometimes add an extra little money on groceries for providing the facilities. Sometimes, they make loans from NGOs to fulfill their needs. Some area basis NGOs provide microcredit loans to the workers. Workers focus on NGOs for the loans (low-interest rate) because it is easy to get loans from any NGO, rather than any bank. Thus saving is challenging with their lot of expenses and loans. Some of the female workers face difficulties in savings because they are the only earning member in their families. Their husbands depend on their income mostly. However, the scenario is different for a few workers who can save a significant amount every month on banks. Some of them have DPS worth of BDT 500 every month. Here both husband and wife earn together and manage their monthly expenses. Families with single earning members suffer in savings.

"I use my garment's bank. There is an option to keep the money. I have legal documents for that. I do not have a separate account. Every month I keep around 3000 taka there."

– Female worker, Ashulia

Mobile Financing Services on the other hand helps the workers at some points. The usage of MFS is common among all workers. Though all workers do not have a personal account they take the services from local agents. They can use the MFS on any emergency. Those who have a personal account, they usually recharge specific amount to their account and can use the money anytime. The workers' who receive their salaries via MFS they utilize the account as their bank account. A worker expressed that MFS helps her a lot.

"I have a NOGOD account, I keep my leftover money in that account. Though it is very new but It really helps."

– Female Worker, Ashulia.

in such circumstances, it is understood that garment workers face complexities in salary management with a variety of expense areas. Though they have very low income, on the other hand, they cannot keep track of their expenses. That is why they cannot save money properly. This brings pressure and uncertainty in the long run to fulfill their aspirations.

6.3 Is Technology Integration Important?

Technology usage among garments workers is different. Many workers have facilities for using technology where some of them are connected through basic smartphone features. Their usage is moving around on some basic applications. Some of them have the capability of using a smartphone, but they do not like to use smartphones more because of distractions. Some of them have the mentality to save money because they think buying a smartphone is a waste and saving this money will help them in future.

"We do not have a smartphone. It takes around 5000 taka to buy a phone. If I waste that much money from my savings then I will be in distress. I do not want to be smart."

– Male Worker, Mirpur

Another group of workers has smartphones, but they do not like to use the internet. They also use separate feature phones. Indeed, workers are not that much tech-savvy and their usage is limited. The workers who have internet connections, join in video calls via IMO with their friends or families. Facebook and other social media users are very less among them.

"I have Facebook. I watch YouTube for news. Most of the time I use it for news. I do not do online calling with family. Because my family members do not have a smartphone. Sometimes I talk to friends in the video call."

– Male worker, Gazipur

Garments workers have long duty hours throughout the week. They only have the scope of using smartphones on their weekend. During the weekend they usually talk with their relatives sometimes in video calls. A female worker said during the discussion that she will talk to her aunt.

"We do not have that much time. Our duty period is so long. At the weekend we can have a little time to use it. I personally use video calling app IMO. There is an aunt of mine. Today I will talk to her in a video call."

– Female Worker, Ashulia

An interesting scenario was found throughout the study. Sometimes workers' house owners provide Wi-Fi services to the workers where they do not need to buy data packs. Through Wi-Fi, they can connect all day long and they share the internet bill. Few of them do not pay the bill, but still, they have an internet connection. However, few workers also do not use Wi-Fi facilities, only because of less interest in using.

"We more or less are connected to the internet. This house has 3 routers. Our homeowner gives this support to us. Sometimes we pay 100tk. The owner never makes pressure on us. He always pays the bill. He is a very good man. I paid 100 taka 2 months earlier."

– Male worker, Ashulia

According to the scenario of their technology usage from a demographic perspective, it is identified that their daily life still ongoing without much technology integration with the availability of the scopes, because they have less interest in using and less exploration of the technology world. The usage scenario is limited with a few easy to use applications. As they use simple mobile technology to get connected with the people, so simplistic mobile technology can help these workers for a better lifestyle.

6.4 What are the Experiences in Job?

In the garments sector, around 4 million workers are enrolled in Bangladesh. We met the workers from 40 different garments in three different regions including compliant and non-compliant factories. For both factories, workers generally get into the jobs in two different ways as a reference and by themselves. It is noted that garments do not post job circular online, print media, or anywhere. There is also no formal structure of recruiting workers in the garments, but before recruiting all garments check workers' legal identification documents. Getting a job through reference is an easier process where a worker gets the job referring by a known person or worker of the desired garments. Few of the workers in the study initially started their jobs through references. On the other hand, without references, getting a job is difficult. Workers have to go to factories gates with the documents and ask for jobs. Sometimes, they have to wait for a long time or have to move to several factory gates. Searching a job is a challenge where most of our workers got their first job by themselves.

"Mainly workers gather in front of the factory gate. Line chiefs, supervisors take the workers inside with specific documents. Then there is a medical test and log all info along with weight and age. Sometimes workers show their wrong documents like fake BIC, NID, wrong address, chairman certificate. These all are now strictly monitored. The present address is the must for emergency cases. Education is not that much needed, but the experience is important. The quality section sometimes requires an educational background to 12 grade"

– Female worker, Ashulia

In job sites, workers from non-compliant garments always suffer from a lot of challenges which are contradicting with workers' rights. In this study, most of the workers from Mirpur and Ashulia areas are working in non-compliant garments. One of the major problems is to work without payment. This is an undocumented process of work and is common in non-compliant garments. To finish the target of the production, workers have to work 2-3 hours more than their documented working hours. For extra working hours or overtime, they do not get paid. In a few garments, overtime is compulsory due to the heavy workload for early shipment. The targeted production quota for workers gets increased anytime. On the other hand, they often get abused for denying extra work.

"We are scared of losing jobs and behavior. That is why we work more for not facing problems. My working period is from 8-5. They give us over the target. We cannot finish and it is not possible to finish. To finish work I work till 7 without money. They do not care about extra timing, whatever it takes. Otherwise, they will beat you or slap you."

– Female worker, Mirpur

Female workers are abused in a large number in non-compliant garments. Line chiefs, supervisors, etc. senior officers often shout and beat them with abusive words for doing the work fast. Additionally, workers get punishment due to any mistake, delaying work, sudden absence from factories, etc. Punishment is hard for the workers because they get suspended for many days and their salaries also get cut off. On top of that, there is no job security of these workers, and anytime they might lose their job. Workers try their best to save their job and continue their work. They always stay remain silent at any issue. In such circumstances, workers sometimes protest collectively to establish their rights. They sometimes come on roads together and protest against authorities. Garments authorities always try to stop the protest anyhow by forcing it.

"Generally, the line chief is male. There are no women. They always abuse women workers. They come and stand by our side. If anything happens, they use abusive words and beat us. Even sometimes they beat us so hard that our hair bands open up from the head."
– Female Worker, Mirpur.

The scenarios are opposite in compliant garments. Workers in compliant garments get many facilities from the authorities. These garments follow the international standard of workers' rights. In our study, the workers were from the Gazipur region are working in compliant factories, and we understood that these workers can lead a better lifestyle than the other garments workers. They have fixed working hours with less workload. Some garments have overtime duty with standard payment where a few workers want to work more for extra money and they feel relax at the workplaces. They also have job security in these garments and the authority pays a sufficient amount if workers lose jobs.

"There is not much problem in my factory. The problem is we do not have Overtime. That means we have a low workload. For this reason, I cannot earn extra money. But it is okay for me. I am happy with it. I get 43, 44 takas per hour Overtime. When there is shipment we get pressure. We work till 10 pm. We get paid for that."
– Male worker, Gazipur

When female workers in non-compliant garments face verbal and physical abuse, at the same time female workers in compliant garments are completely satisfied with their work environment. They have full access to talk freely with senior level officers. Even workers have no objection against the authorities. They do not usually protest. A male worker shared that their supervisor think them as their family member.

"Nowadays supervisors are good. They consider us as their family. We are happy with their behavior. No abuse here. We pass around 24 hrs with them. We just come home to sleep. Like, the factory is our only family. Supervisors never shout to us."

– Male Worker, Gazipur.

A better job environment exists in compliant garments where maintaining worker rights is the highest priority. Though recruiting to the job process is similar all over, workers can get a better job environment if all the factories carefully follow up on the workers' rights.

6.5 How Workers get Empowered and Moving towards Aspirations?

The households visited had families consisting of working couples, many of whom had young children living with them or living in villages. The low-income families showed respect towards the stable income of the female member of the household sharing the information that the majority of the workers are women. The discussions showed respect, acceptance of female earning, and decision making – many of the decisions revolved around their children. The findings opened up new directions towards equality and empowerment of women, showing promises considering Feminism in the South Asia region [Sabur, 2019].

Our studies, through the elaborate discussions, revealed aspirations of garment workers which focused selflessly on their children in many cases. Workers have shared that they spend around BDT 1000 to 1500 on private tuition, coaching, and extra study materials on children to ensure the best education for them. Many parents wished that their children would be educated and would not have to work in factories. There was a garment worker father who wished his daughter to be a computer engineer in the future. He engaged in long discussions with researchers beyond the regular discussion session sharing his dreams around his daughter. Two unmarried male garment workers shared their desire to study further given an opportunity for that and few female garment workers shared their desire to learn English that could lead towards a promotion. It shows that the opportunity for education can become an enabler for garment workers as well as their offspring in the coming days.

"I don't want to destroy my daughter's life. Education is really important. Even it is important for garments jobs recently. My daughter got the highest marks in English and Mathematics. She is in a kindergarten class. I sent my daughter to her grandmother for a few days. She will come tomorrow. Her teacher thought that I took her away. She requested me not to miss class"
– Female Worker, Ashulia

6.6 Why Concentration on Health is Crucial?

Health is an important area that we explored in our study. The workers work all day long and they have less concentration on their health due to the heavy workload and the fulfillment of their aspirations. Workers have many expense areas where healthcare is completely missing. Similarly, negligence of workers' health is also visible from non-compliant garment authorities' perspective. That is why health-related issues are always not openly discussed among the workers. The most interesting thing is workers from non-compliant factories do not drink adequate water for a few reasons. The scenario is different in compliant factories where workers do not have any restrictions. Female workers from non-compliant garments usually do that only to reduce the scope of going washroom due to heavy workload. Workers cannot manage time for that, sometimes they want to go to the washroom, but senior officers create pressure on workers to be sited for the work. They often get shouted by the supervisors if they are not the line. On the other hand, the authorities of these factories do not care about the healthcare of the workers. Workers always work hard and the majority of the workers feel tired at their workplaces. These issues bring negative impacts on workers' health.

We cannot manage time to go washroom. They do not restrict us. we don't go for workload. If we go to the washroom, it will take 5 minutes. By the time we can work more. If they don't find us anyhow they shout on us. So, we usually do not drink water that much to save time. We restrict ourselves in this case. We always do that."

– Female worker, Mirpur.

The alternative scenario exists in compliant garments where workers have no restrictions on drinking water. They have facilities to keep water bottles at their working table. There are no restrictions on going to the washroom, and it is also announced from the authority that if workers face restrictions from anyone they can inform the authority. It is noted that all garment factories consider maternity leave for female workers along with their monthly salaries. Compliant garments, on the other hand, always provide support specifically on maternity health issues during work which is sometimes missing in non-compliant factories. Female workers get more than 3 months of maternity leave. The workers get properly paid through these times and some garments pay extra money for childcare at the same time.

"We get the maternity leave for 110 days. By this time they give 25k. After the birth of the child if you submit child BIC to garments you will get again 25k. So in total 50k."

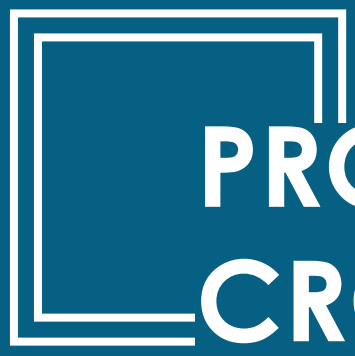
– Female worker, Gazipur

Not visiting doctors is a part of negligence from workers' end. They only visit doctors when they are severely sick. They want to save money, not tending buying medicines. They focus on cheap medicines for their wellness. Workers in compliant factories always get medical support during any medical emergencies at their workplaces. They get general advice from the medical team of these factories. This facility helps workers not visiting the doctors outside. Here workers also get free medical treatment as per workers' rights.

"There is a medical team inside the garment. If someone feels sick you, s/he can go to the doctor. They will prescribe you even sometimes they provide medicines. If workers feel so sick they will grant emergency leave or carry her to Hospitals via their ambulance. The company will bear the expenses. They will not cut down the salaries."

– Female Worker, Gazipur

For better wellness, concentration on health is really important. If workers feel tired at their workplaces that means workers are getting weak for hard work without taking any medical care. Some workers feel better on the other hand, only because they get support on healthcare from their workplaces. Thus, for leading a better lifestyle, concentration on health is crucial.



PROPOSED CROWDSOURCING

7. CROWDSOURCING PLATFORM

This study referring to garment workers in Bangladesh. The broader aspects of ICT for Development, aspiration based design are illustrated as our works for marginal communities referring to the ICT for the Developed community and we have worked with workers around aspiration based computing. The work relates to workers position in the society where the majority of the garment workers are female touching feminist HCI and proposing our desire to ensure social justice presenting research work that directs towards future goals. We rely on factual details collected from various news sources and web-based resources to set the context on the garment industry in Bangladesh along with scholarly studies.

7.1 Social Justice

Researchers among the HCI community have considered the concern of ensuring social justice to marginal communities based on race, gender, economic solvency, or any other criterion [Bardzell, 2010, Strohmayer, 2019, Kumar, 2019, Ogbonnaya, 2020]. In the context of Bangladesh, a community where the majority of the workers are women, having around 90% female workforce [Islam, 2016] provides a major shift of conventional patriarchal values [Sultana et al., 2018, Sultana, 2010, Sabur S., 2019]. Generally, there is a general dominance of men in society as has been studied in the context of the country. There has been work focusing on women in Bangladesh to support rural women [Sultana, 2018], urban women [Nova, 2019] using technology intervention considering patriarchal limitations. There has been work around ensuring social justice focusing on ensuring rights to marginal communities [Mizan, 2018, Kumar, 2018]. This work relates to women's earning is acceptable in families where social justice is required in future design.

7.2 Design for Marginal Communities

The research community working to introduce technology intervention to marginal communities have formed the ICT for Development, ICTD community [Pal, 2009, Pal, 2007, Pal, 2008, Toyoma, 2015, Sambasivan, 2018, Sambasivan,2019, Sambasivan, 2017, Sambasivan, 2019, Wyche, 2013, Wyche, 2016, Kumar, 2015, Tuli, 2018, Abid, 2017, Mustafa, 2020, Nova, 2019, Mizan, 2018, Kumar, 2018, Ismail, 2018, Dray, 2003]. The work covers a vast majority of developing nations ranging from Asia, Africa, and marginalized communities in developed regions. We present a high- level discussion on the vast area of ICTD concentrating on aspiration based design [Pal, 2009, Pal, 2007, Pal, 2008].

A generic picture on technology disparity in the developing world has been discussed by Dray et al. [Dray, 2003] focusing on infrastructural challenges. There have been similar studies in the broader context of developing regions showing the internet and its usage disparities in the African region by Wyche et al. [Wyche, 2013, Wyche, 2016] where access to technology was a major problem a few years back. The situation has emerged over the years and internet availability has improved in developing regions.

However, access to technology remains a challenge for various reasons. Sambasivan et al. [Sambasivan, 2018, Sambasivan, 2019, Sambasivan, 2017, Sambasivan, 2019] discussed major gender disparity around technology usage where women from South Asia are far beyond their male representatives in the regional context. There are social factors along with the availability of technology resources.

7.3 Crowdsourcing in Support

Crowdsourcing plays a vital role in emergency support where online social media collects a lot of data from various sources within a very short time [Gao, 2011]. Sometimes group sourcing supports crowdsourcing [Gao, 2011]. Ushahidi is a similar kind of crowdsourcing platform as well as a crisis map relief organization deployed in Kenya, Afghanistan, Haiti, and Mexico, collected data from social media networks [Heinzelman, 2010, Gao, 2011]. Facebook on the other hand collects a lot of data. Facebook has launched its Crisis Response feature worldwide where it can connect and support the people in any area during the crisis [Crisis Response, 2020]. However, some of the work specifically focuses on developing nations. Mariyam et al. came up with Smartphone Systems for Emergency Management (SPSEM) system which can provide emergency support where this system requires smartphones [Maryam, 2016]. Latif et al. worked on the impact of OpenStreetMap in Bangladesh, providing emergency support in distant regions during any natural disasters [Latif, 2011].

7.4 Crowdsourcing in Workplace

Crowdsourcing platforms are generally used to get feedback data from a large crowd and sometimes in managing tasks. Some scholarly works discussed the crowdsourcing accessibility in the workplace. A group of scholars presented a platform for workplace accessibility where they can distribute tasks and invite employers for micromanagement [Takagi, 2013]. Heikkilia et al. discussed the feedback dashboard from quantified workers using the crowdsourcing method [Heikkilia, 2018]. Crowdsourcing sometimes helps digital labor unions to know about the outsourced and cheap labor in developing countries [Arora, 2018]. They also proposed a conceptual model of a crowdsourcing platform for tools, workers, and brand dialogue [Arora, 2018]. Feedback crowdsourcing data of the workers can be easily collected using a cell phone [Newlands, 2017]. In 2016, a Silicon Valley startup LaborVoices launched a mobile-based platform, SmartLine Symphony, which allows workers to anonymously report abuse, safety issues, delays in payment, or children in the workplace and also they gave access to the information to everyone in the supply chain, providing factory owners the opportunity to proactively address workers' concerns before damaging their relationship with key clients [Gill, 2016]. Workplace Feedback System (WFS), a crowdsourcing platform was developed specifically for workers of garments factories in Bangladesh which helps to get the visibility gap created by factory audit practices [Abbasi 2018]. Apart from that, some applications focus on garments sectors. Garments Job, this application was developed in India where they keep posting job circulars in a continuous process based on areas [Garment Jobs, 2020]. In Bangladesh, there are no such platforms for searching for a job in garments sectors. Garments Job and career in BD and Garment Directory are two different applications where they focus on the details of the garments factories [Garments Job and Career in BD, 2020, Garment Directory, 2020]. BRAC University, Bangladesh launched a platform named "Mapped in

Bangladesh" which can locate all the garments across the Dhaka division along with specific details of the factories [Mapped in Bangladesh, 2020]. This platform will help workers to find other near factories. Sromik Jigyasha is a different kind of application which is developed by Bangladesh Legal Aid and Services Trust (BLAST) communication that focuses on workers' laws and rights, and workers can post their sufferings to the BLAST Communication for seeking help [Sromik Jigyasha, 2020]. We on the other hand, proposing a different kind of platform that focus on garments workers for their better lifestyle.

7.5 Reasons of Proposing

In our research study, we understood the workers' social connectivity, finance management, job searching method and environment, technology usage, and perceptions on personal healthcare. Workers have very good social connections within the neighborhood (e.g.: employers from garments) even with their house owners, where some house owners provide them internet support. They can get emergency support at any time. On the other hand, workers are locally known to each other. Moreover, constant connection with the community people is really important for any emergency support.

Apart from social life, workers face problems with getting new jobs. Sometimes they have a negative experience in their workplace, which brings a need to change the job. In such scenarios, workers are helpless to find out a new job according to their expectations as there is a lack of proper job advertisement system for to this community. Workers get the job by reference or by themselves. Under these two traditions often many qualified workers or people who are in dire need of work miss the opportunity. An open online or map-based crowdsourcing platform can help in this regard, where the openings can be shared might improve the experience of searching and getting a job in garment industry.

From our study, it was clear that workers have low income along with a lot of expenses including rents, groceries, children's education, loans, etc. Therefore, from their limited income, they aim to save a little amount but in many cases, they are not able to save due to the proper planning of expenditures. We are suggesting a money management feature in our platform to address this issue where workers will be able to plan their monthly expenditures and divide their costs accordingly. By keeping track of their daily expenses they will be able to keep a proper calculation of their earning and expenses and plan their monthly savings accordingly.

The workers have a low concentration on their healthcare, they are not willing to spend, and often they ignore their physical discomforts and avoid to visit doctors to reduce the extra medical costs. We have proposed the emergency medical features, where not only they can access the government's virtual medical support hotline but also they can easily access to the other emergency support lines such as national emergency hotline, local police, etc.

Another major finding of our study includes the stress and health issues caused due to working over hours that impacts their health and mental conditions slowly. We are suggesting a unique platform where workers can input their daily health and mental status followed by the working hours. We have proposed to score the health and mental status following the Mood Meter application

that was developed based on the 'Five Degrees of Happiness Theory' [Mood Meter Android App, 2020, Veenhoven, 2017].

A question can be raised that, how many workers might be comfortable adopting a new technology platform, where they have very limited and simple usage scenario in technology. However, workers are familiar with both feature phones and smartphones, thus we are proposing such an easy to use the platform in native language- Bangla. Our proposed system has two options such as USSB based System which can be used in both feature and smart phones and doesn't require any internet connection and an application for only smart phone users (where most of the features are accessible without an internet connection) to get the maximum efficiency and access to all the features to provide them a better lifestyle experience.

7.6 Proposed Platform

Our proposed design to support the garment worker's community has been inspired by aspiration based design [Pal, 2009, Pal, 2007, Pal, 2008] presented by Pal et al. Workers preferred to use technology intervention based on their aspiration to have a better life, a life that revolves around their next generation, their children. It was assumed that technology intervention would enable their children to lead a life beyond the laborious work in garment factories. There has been warning against the utopian view that technology would solve many of the existing problems, as has been assumed in the context of developing regions [Toyoma, 2015]. After doing rigorous amount of reviews and analysis on the findings of our qualitative research we ended up designing a crowdsourcing platform that offers a variety of features such as emergency support, look for new jobs, keep a track of their monthly income and expenses, and share their daily experiences. Our study clearly denotes that a significant number of workers don't have access to smart phones of application technology yet. However, our design includes two different technology interventions- Unstructured Supplementary Service Data (USSD) and Application. While the USSD can be used both from a simple feature phone and Smart phone, the application offers more variety of features and efficient, optimum user experience for the smartphone owners.

7.7 Features of the Proposed Crowdsourcing Platform

7.7.1 USSD Mode and User Experience Design

USSD (Unstructured Supplementary Service Data), also known as 'Quick Codes' is a communication protocol for mobile communication (GSM) used by cellular phones to send text messages [USSD]. A USSD message can be up to 182 characters long, establishing a real-time communication session between the phone and a network or server [USSD]. USSD services doesn't require any internet connections. With USSD, users interact directly from their mobile phones by making selections from various menus. During a USSD session, a USSD message creates a real-time connection. This means USSD enables two-way communication of information, as long as the communication line stays open [USSD]. USSDs are one of the oldest mobile technologies that have been practiced for years by the mobile phone users.

As, the target user of our platform are the garment workers we

had to consider the significant number of workers who don't have the ability to own a smartphone but the cellular phones with prior knowledge of using USSD or feature codes such as for checking balance, buying mobile data, mobile banking etc. While designing the system we had to consider these significant people who don't have the access of smartphones. However, to address this problem we have come up with the idea of introducing a USSD based service for the workers.

The USSD based system doesn't cover all the services as the application. But, it offers to the users' two most necessary features such as, Emergency Support and job search. Users may have to dial a specific number (e.g.: *xyz#) and then there will be a pop-up dialogue with the features. In emergency support features, a user can directly dial to national emergency number (999) for any support, national health support line (16263), and physicians from the government-approved hospital (09611677777). For job searching, users can get all the garments job circulars according to their convenience. This service doesn't require any internet connection and can be used from any mobile- device that is registered to a mobile operator's network. The figure 14 below shows the step by step user journey of the USSD based service.

7.7.2 Smartphone Application and User Experience Design

Smartphone application or Mobile Application, also widely referred as 'Mobile App' or just 'App' is a computer program or a software application designed to run on a mobile device such as a phone or tablet. The wide spread of smart phone usage and demand for different apps caused a rapid expansion in application developments. Generally, Apps can be downloaded from application distribution platforms, such as the App Store (iOS) or Google Play Store. applications are often different from desktop applications which are designed to run on desktop computers, and web applications which run in mobile web browsers rather than directly on the mobile device [Mobile App].

In current days, the usage of mobile applications are very common. In our studies the majority of the participants had access to smartphones directly or indirectly. Those who doesn't have any personal smartphone, often get access to the smartphones of their family members, neighbors, coworkers or friends. Using, the spouse's device is a really common scenario. In most cases we got a picture of significant uses of smart features such as video calling, YouTube, and other social media usage. Considering all the existing key elements we are proposing a design to automate the bookkeeping process to support the population. This design implementation includes a application and a database.

The application has more variety of features and easy to use interface in Bangla language. The app has been designed deliberately using interactive icon which make the app interface easy to understand especially to the workers who are not much educated. In the application, we have suggested more features considering our findings. Most of the features of this app doesn't require any internet connection. Only the 'Job' feature need internet connection as it connects the user to a global database where all the job offers are stored. The following part of this section includes a brief overview of the features.

•For emergency support, we propose the same options as USSD

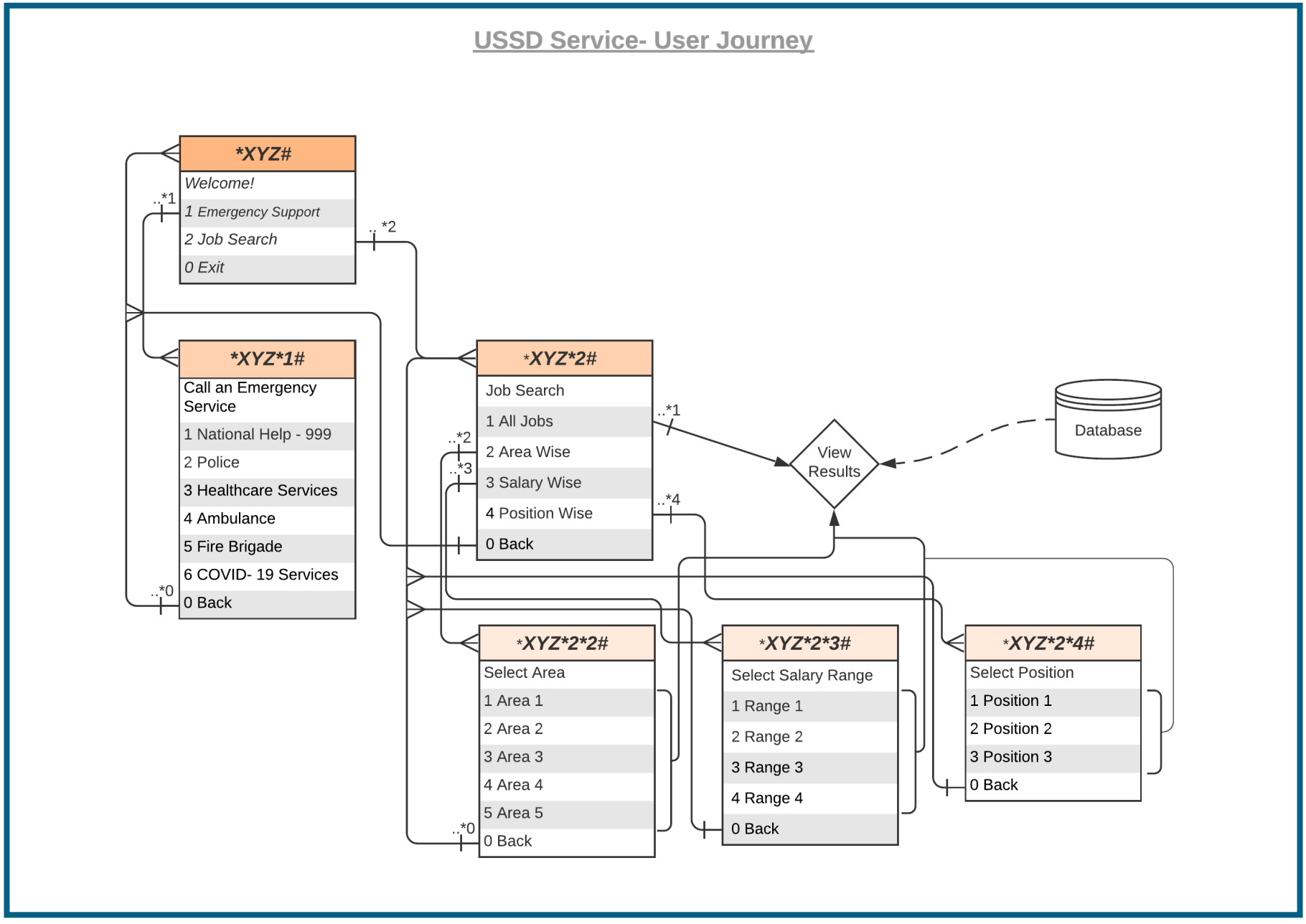


Figure 14: USSD Mode of the Crowdsourcing Platform

mode, additionally, we suggest fire brigade support, ambulance support, police support, and specifically an emergency contact number (added by the user) for any local emergency support.

•For Daily Data feature, workers may keep track of their working period and can score their health situation and mental wellbeing in the experience scale. Through this input, workers can understand their daily and monthly pattern of health and mental wellbeing.

•For finance management feature, users may keep track of their expenses, loans, and incomes. At the end of the day, they can look into their savings scenarios that will help workers to plan further.

•In the job search feature, a user needs to get connected with the internet and can either add or search jobs. In the Add Job option, user can add a new job opportunity while in search job option users will be able to see the available jobs which are added by the other users. Users can search the job according to the area, position, and salary preferences. This feature will help the garments workers to get the job easily.

User Experience Design of our Smartphone Application

At first, a user needs to install the application in their smartphone.

Signup and Login

The first step to access the main features of the application is to login or signup. We have proposed login with other account such as Google or Facebook account as well to make it easier. For the first time users, they need to setup their account with mobile number and password or using their other media accounts. In the next step they need to give certain information regarding their national ID, job, emergency contact, blood group etc. These data will be stored in a local database of their phone's memory. Only the emergency contact can be accessed from the login page in case of any emergency. The other data can only be shared with the permission of the user. After a successful signup the user will be redirected to the login page. The old users can simply login by entering their previously set credentials. The proposed graphical representations of the Signup and login Phase are as follows in figure 15(a).

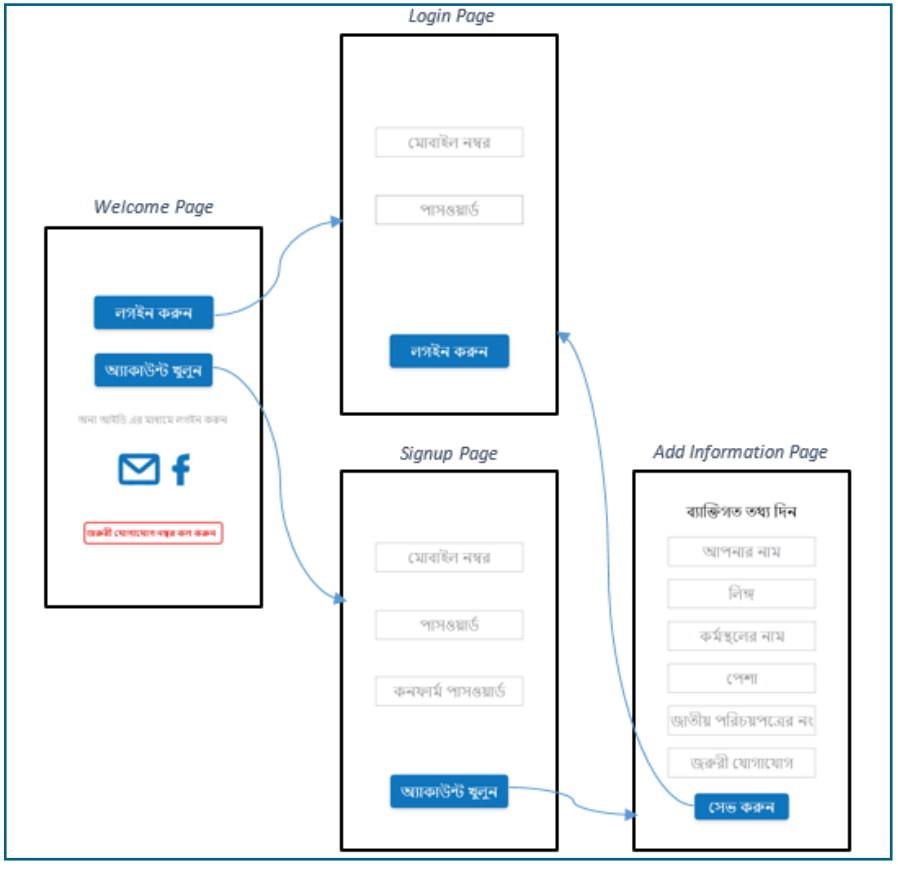


Figure 15(a). User journey of Login/ Signup

Emergency Support

After a successful login users will be redirected the main feature's page. There are in total four features.

The first feature is Emergency Support feature. When a user press the emergency support in the features page, they will see this page. In this page, emergency support numbers including a personal emergency number will be available. This page is more like a number directory from where the user will be redirected a call to the certain emergency support they look for. The graphical representation of this part is shown below as Figure 15(b),

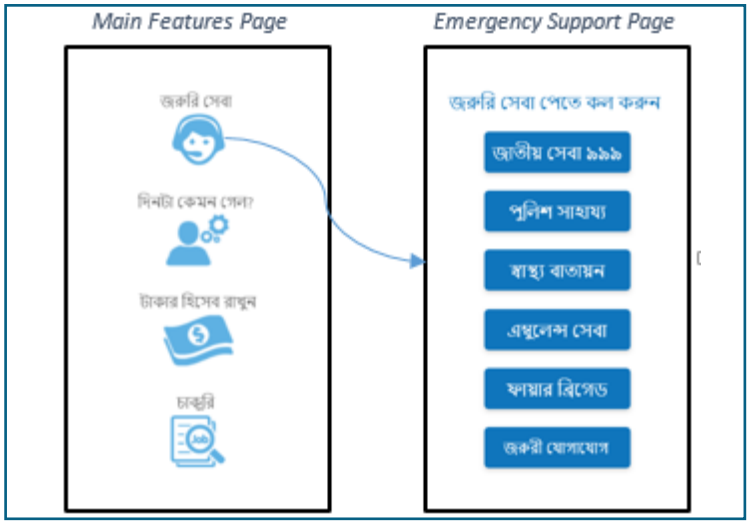


Figure 15(b): User Journey of 'Emergency Support' Feature

How Was the Day?

This feature will let the user store their regular working hours, health conditions and mental feelings. Users will input 3 data every day and can view their daily data and monthly overview of last 30 days. This unique feature will help the users understand the fluctuation of their health and mental state according to their load of works. This will also help to keep a track of their daily and monthly overtime hours. We have used an emoji scale to measure the health and mental data. This scale was proven effective to make people from different societies aware and improve themselves previously [Veenhoven, 2017]. Figure 15(c) represents the feature's UI representation

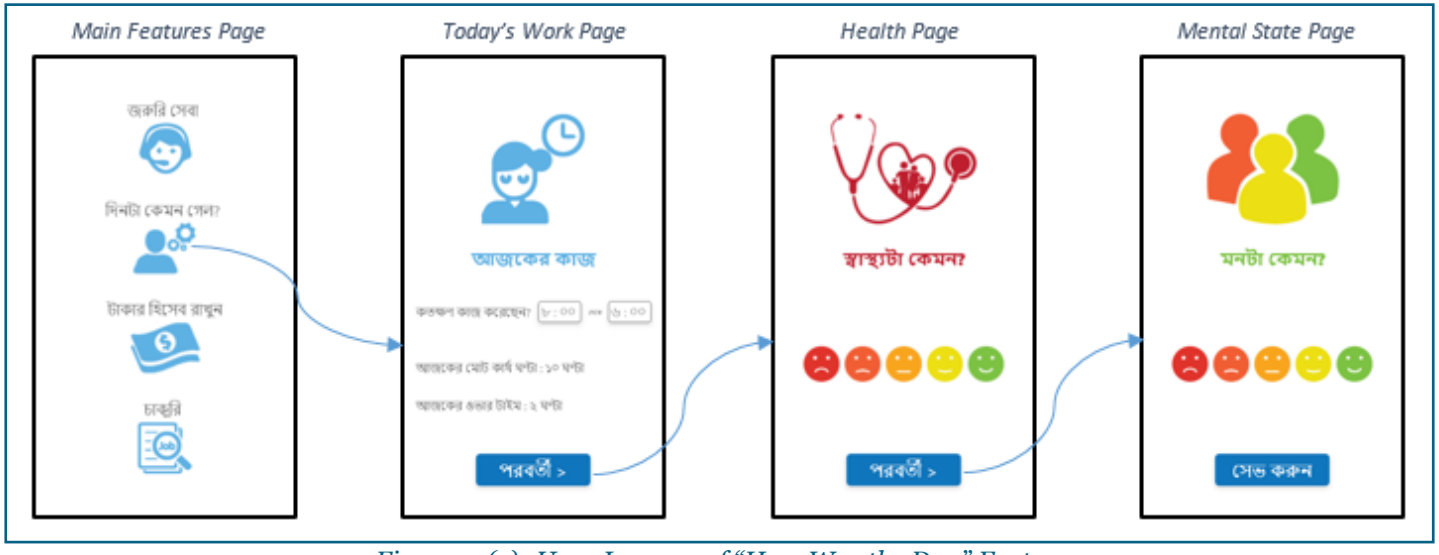


Figure 15(c): User Journey of "How Was the Day" Feature

Money Management

This feature is a simple financial management page that will allow the users to keep a calculation of their total income and expenses and show their total savings. This option will help the workers to be thrifty with their earnings and save for future. In Figure 15(d), we get the visualization of the Money management feature.

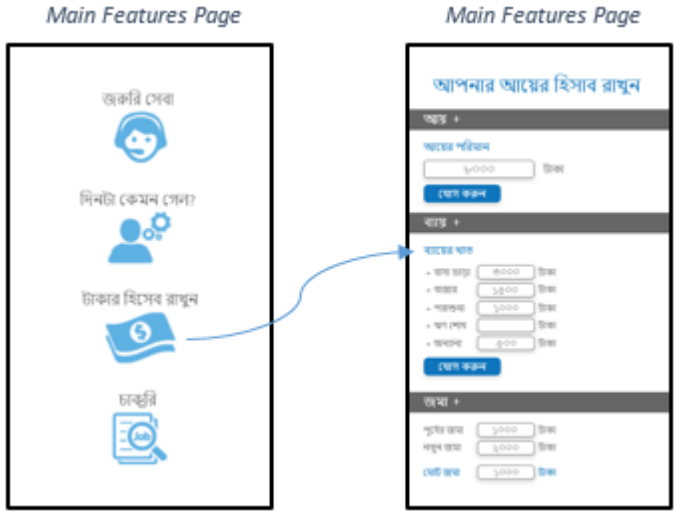


Figure 15(d): User Journey of "Money Management" Feature

Job

This is the last feature of the application. Only this feature requires and internet connection as it is connected to a global database. If a user is not connected to the internet then it will show a dialogue box to get connected to an internet connection. A user can both add and search job using this feature. When a user add a job it will be stored in the database and will be visible to the other users who are searching jobs. There is a preference filter that will allow the users to search jobs according to their preferred are, position and salary. The user journey of 'Job' feature is shown below in Figure 15(e).

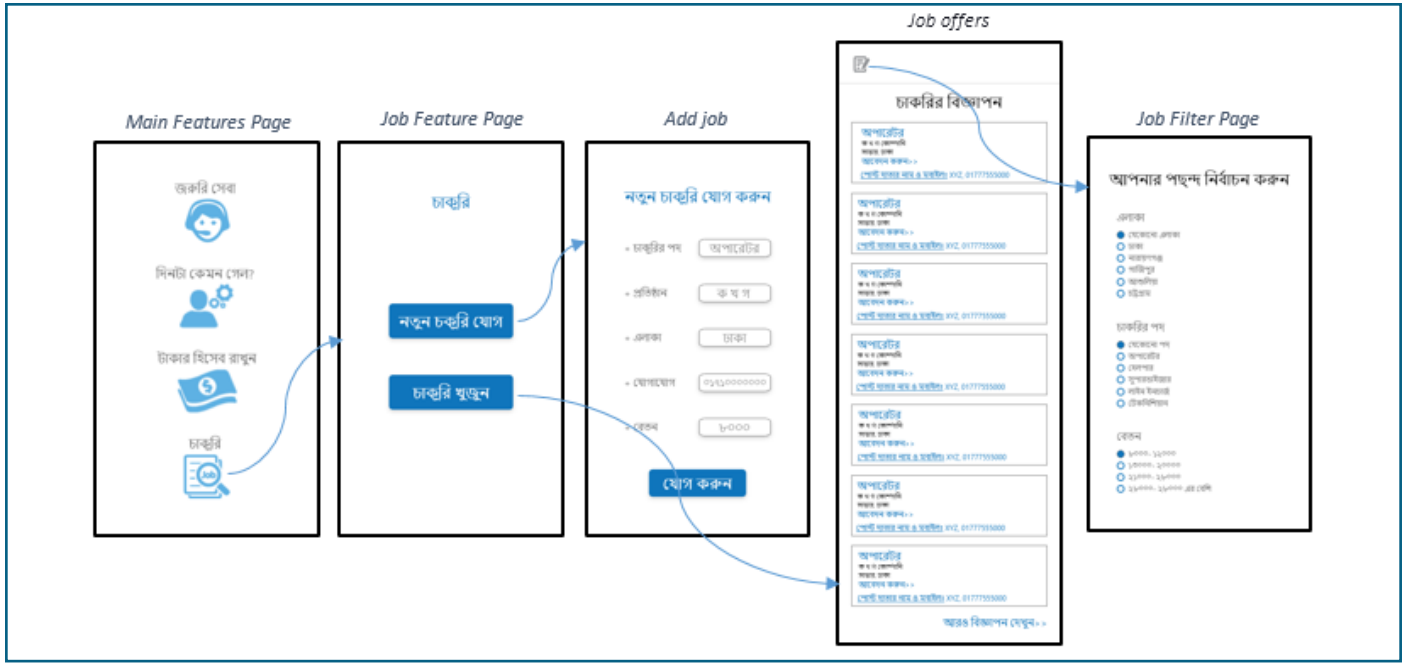


Figure 15(e): User Journey of "Job" Feature

Below, we have presented Data flow representation of the application in figure 16, Application tree in figure 17, and cloud link of the proposed crowdsourcing platform. We are very hopeful and looking forward to the development of this platform.

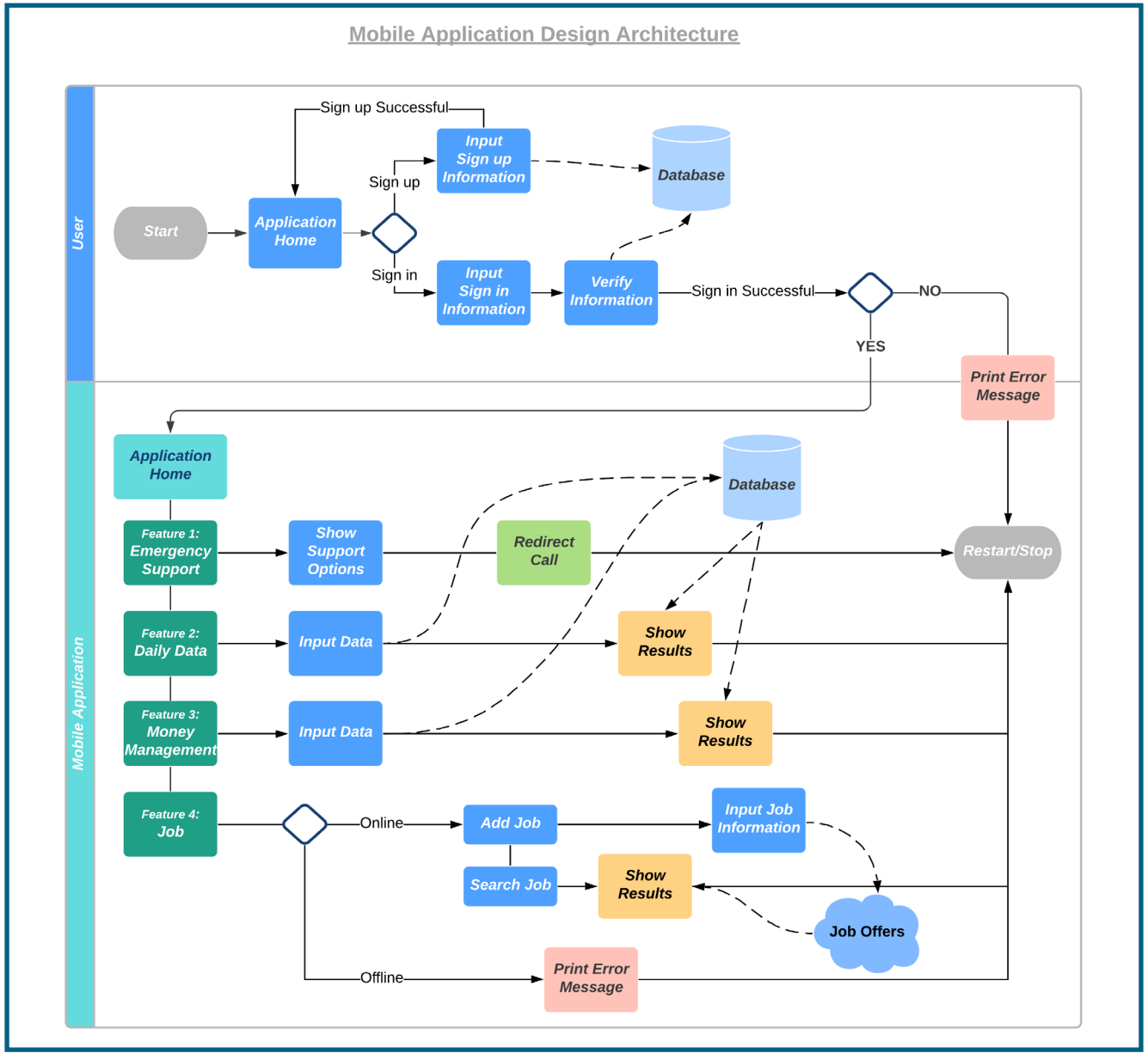


Figure 16: Data flow representation of the mobile application

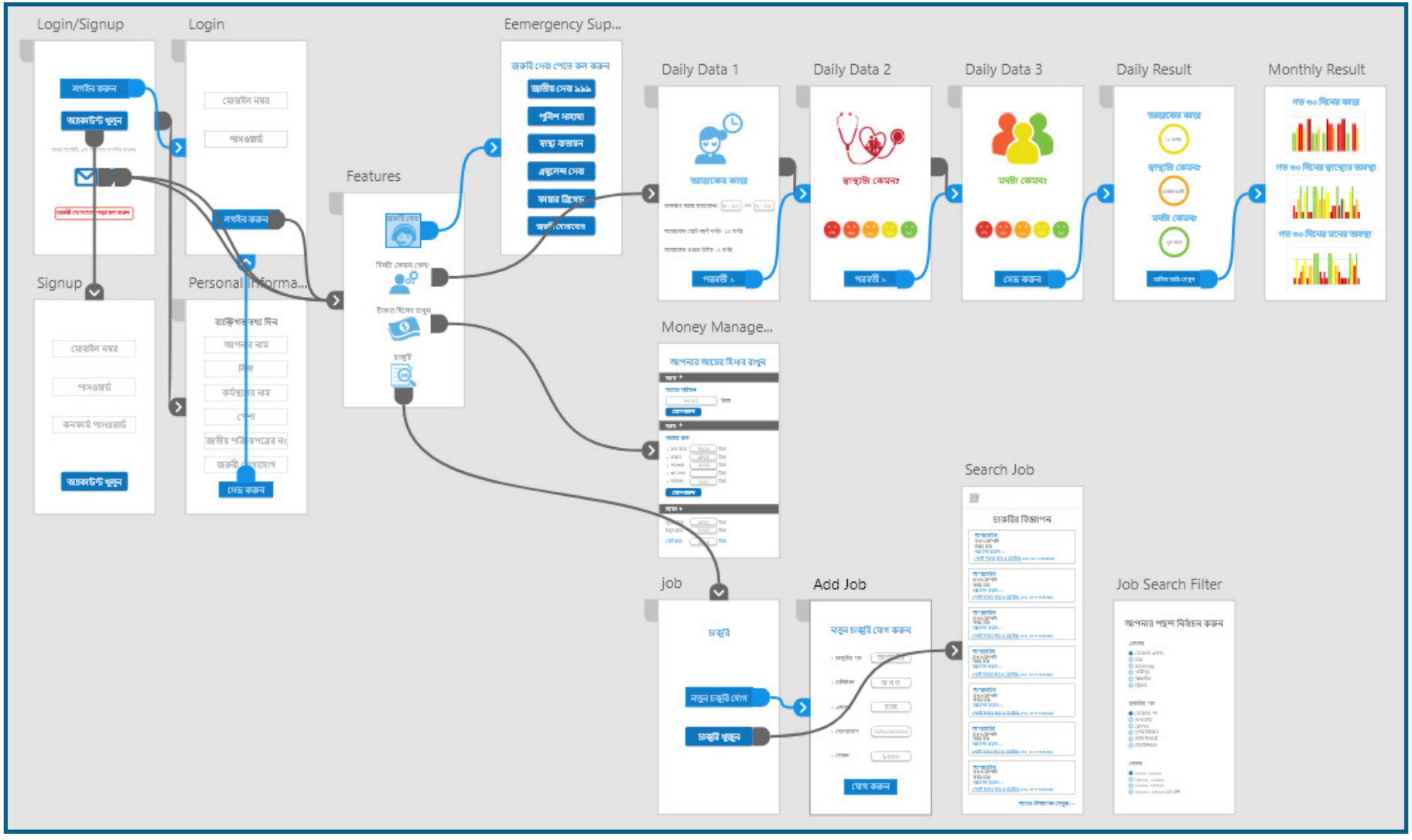


Figure 17: Application Tree

We attach the cloud link of the wireframe design of the proposed platform:
https://xd.adobe.com/view/53f1a3fb-f95e-4154-7bc5-10b64a3ca5df-25c0/

7.8 Design Limitations

Our qualitative studies unfolded few interesting findings. The workers concerns about their children's education, dreams about their bright career and also their thoughts of ensuring a secured, peaceful future after retirement from garment industry were significant. Few garments offer low cost or free child care and monitoring to their workers while most of the factories don't have any such services. We believe that these are some sectors yet unexplored and there are lot of voids to fill.

We thought of including a feature in our app where the children can learn remotely using existing online academic platforms. But unfortunately there is a lack of virtual teaching tools, and contents which can specifically support this community and that can be relied on. Initially our design suggests a well sorted Channel or playlist with quality contents that are kids friendly, synchronized with our crowdsourcing app so that these working parents can keep an eye on their children's education and track their progress without hampering their jobs in a cost effective way.

8.
CONCLUSION AND FUTURE WORK

Our study explores existing challenges of garment workers. A close look at the current concerns can be used to develop platforms to support this community through providing ways to report their wellbeing along with reporting available jobs in the close proximity. There are opportunities to further expand support the aspirations of this community through opening up ways for learning, supported by local community and/or local technology support platforms.

DURING COVID- 19 STUDY AND OUTCOME

In the mid of March, when the whole country was locked down due to the outbreak of COVID-19, we were concerned about these people as we felt that this community is at high risk due to the contagious nature of COVID-19. Therefore, we wanted to get back to them to know how they are doing and thinking during this pandemic. So, we planned a follow-up study by making individual phone calls to few individuals who participated in our focused group discussions. We called several participants and got response from n= 12 participants (8 males and four females). Each discussion was around 10- 15 minutes long, and it involved queries about the community's preparedness.

The workers were not prepared to take care of any possible health-related hazards at a personal level or authority level. Due to lockdown, maximum garments remained shut without providing monthly wages to the workers, which initiate unwanted financial instability in their daily life. The majority of the workers always face a lack of living standards where concerns around social distancing revealed in conversations. The workers are living in a congested place where they have the crisis of adequate living support such as shared washrooms and kitchen mostly. In a congested living condition as well as work conditions, maintaining social distance is challenging. Any contagious diseases (e.g., COVID-19) might harm a large scale in a shared space. - Workers never faced these situations before, and they do not know where and how to get emergency health support and how to deal with COVID-19. These workers wanted to return their workplace to deal with their crisis without thinking of their healthcare. This was a major concern among participants who were not sure about their next month's salary, about the closure of the factory and finally, about food security.

It was clear that a generic suggestion of social distancing is not applicable in the scenario of the population living in densely populated regions. The minimal distance among families and individuals living together asks for consideration where the entire community as a unit. Lack of concern about healthcare and returning to work might make the situation more complicated for them and the connected communities. A single person infected with highly contagious COVID-19 could impact the entire community very fast. The current challenges open up opportunities to design better support and policy intervention in the coming days.

A detailed work on this during COVID-19 study and findings were published entitled as "Social Distancing Challenges for Marginal Communities during COVID-19 Pandemic in Bangladesh" on Journal of Biomedical Analytics [Nova, 2020]

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APPENDIX

Table 1: Age Range of the Participants

Gender	Age (18- 20)	Age (21- 30)	Age (31- 40)
Female	4	23	5
Male	4	11	8

Table 2: Participants (Female) Education and Marital Status

Female	FGD Area 1	FGD Area 2	FGD Area 3
Female (18-20) + <SSC + Married		1	2
Female (21-30) + <SSC + Married	8	11	4
Female (31-40) + <SSC + Married	3		2
Female (18-20) + <SSC + Unmarried			1

Table 3: Participants (Male) Education and Marital Status

Male	FGD Area 1	FGD Area 2	FGD Area 3
Male (18-20) + <SSC + Married	0	1	0
Male (21-30) + <SSC + Married	1	4	1
Male (31-40) + <SSC + Married	3	3	0
Male (31-40) + SSC + Married	0	0	2
Male (18-20) + <SSC + Unmarried	0	0	2
Male (21-30) + <SSC + Unmarried	1	0	1
Male (21-30) + SSC + Unmarried	0	0	1
Male (18-20) + HSC + Unmarried	0	0	1
Male (21-30) + >HSC + Unmarried	2	0	0
	18	20	17

Table 4: Participants Technology Facility

Gender	Internet Facility	Actually Use	Smart Phone
Female	12	9	15
Male	18	12	13

Table 5: Participants (Female) Smartphone and Internet Usage

Female	FGD Area 1	FGD Area 2	FGD Area 3
Female (18-20) + Smartphone + No Internet			2
Female (21-30) + No Smartphone + No Internet	2	8	2
Female (21-30) + Smartphone + Internet	2	4	3
Female (21-30) + Smartphone + No Internet	4		
Female (31-40) + No Smartphone + No Internet	3		2

Table 6: Participants (Female) Smartphone and Internet Usage

Male	FGD Area 1	FGD Area 2	FGD Area 3
Male (18-20) + No Smartphone + No Internet			1
Male (18-20) + Smartphone + Internet			2
Male (21-30) + No Smartphone + No Internet	2	3	
Male (21-30) + Smartphone + Internet	2	2	3
Male (21-30) + Smartphone + No Internet		1	
Male (31-40) + No Smartphone + No Internet	2	1	1
Male (31-40) + Smartphone + Internet	1	1	1
	18	20	17

Table 7: Participants Migration

Gender	Northern	Southern
Female	21	11
Male	15	8

Table 8: Participants (Female) Job Experience

Female	FGD Area 1	FGD Area 2	FGD Area 3
Female (18-20) + Non-Compliant + Negative Experience			1
Female (18-20) + Compliant + Positive Experience			2
Female (21-30) + Non-Compliant + Negative Experience	8	12	
Female (21-30) + Compliant + Positive Experience			4
Female (31-40) + Non-Compliant + Negative Experience	3		1
Female (31-40) + Compliant + Positive Experience			1

Table 9: Participants (Male) Job Experience

Male	FGD Area 1	FGD Area 2	FGD Area 3
Male (18-20) + Compliant + Positive Experience			3
Male (21-30) + Non-Compliant + Negative Experience	4	4	
Male (21-30) + Compliant + Positive Experience	1		3
Male (31-40) + Non-Compliant + Negative Experience	3	2	
Male (31-40) + Compliant + Positive Experience	1		2

Table 10: Participants (Female) Savings Scenario

Female	FGD Area 1	FGD Area 2	FGD Area 3
Female (18-20) + Compliant + No Savings			2
Female (21-30) + Non-Compliant + Savings		5	
Female (21-30) + Compliant + Savings			3
Female (21-30) + Non-Compliant + No Savings	8	7	1
Female (21-30) + Compliant + No Savings			1
Female (31-40) + Non-Compliant + Savings	1		
Female (31-40) + Non-Compliant + No Savings	2		
Female (31-40) + Compliant + No Savings			1

Table 11: Participants (Female) Savings Scenario

Male	FGD Area 1	FGD Area 2	FGD Area 3
Male (18-20) + Compliant + Savings			2
Male (18-20) + Compliant + No Savings			1
Male (21-30) + Non-Compliant + Savings	1		
Male (21-30) + Compliant + Savings			2
Male (21-30) + Non-Compliant + No Savings	3	4	
Male (21-30) + Compliant + No Savings			1
Male (31-40) + Non-Compliant + Savings	1	2	
Male (31-40) + Compliant + Savings		2	2
Male (31-40) + Non-Compliant + No Savings	2		

Figure 1: Initial Stage of Wireframe Designing (Stage 1)

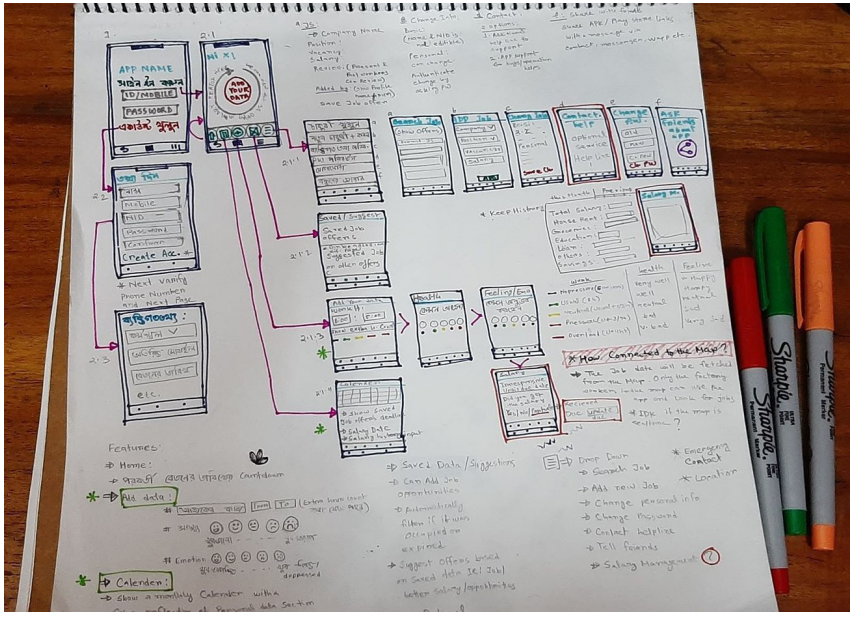


Figure 2: Initial Stage of Wireframe Designing (Stage 2)

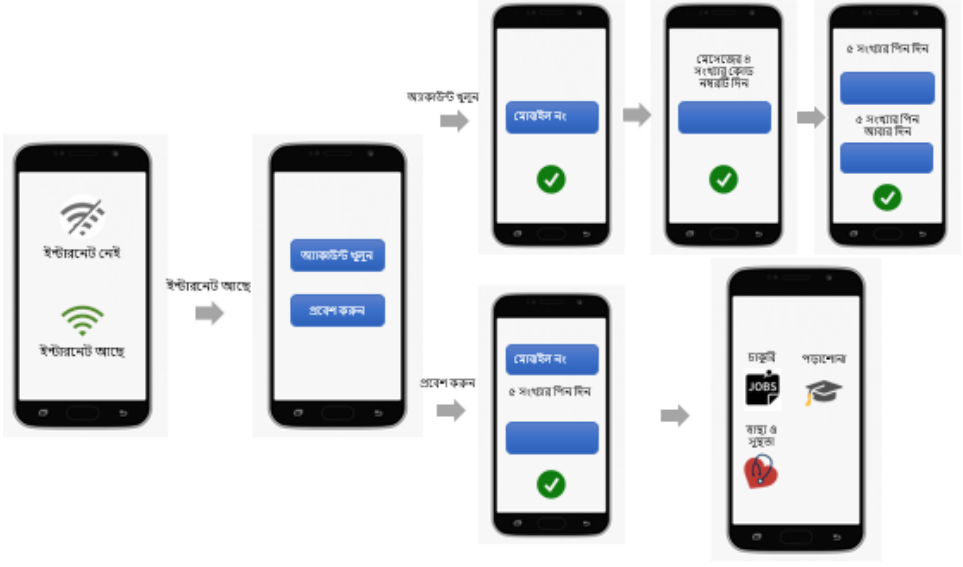
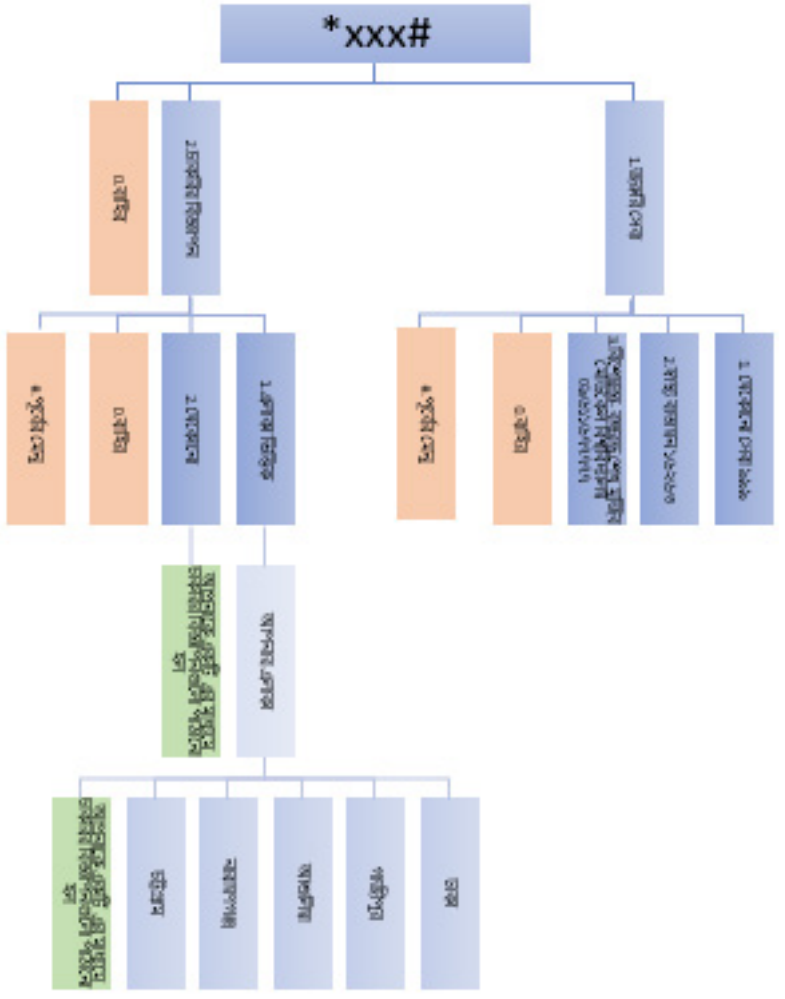


Figure 3: Initial Stage of USSD Designing



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