

1. Abstract

Time use studies rely on either participants keeping track of their activities or data collectors observing and interviewing participants. This is effort intensive relative to the quality of data thus collected.

In this project I attempt to create a Time Use Data collection tool that is context aware, effortless for the respondent and saves data in a research-convenient format. Samay Lekha is a smartphone application which attempts to enable data entry as easy as any daily routine for the respondent while the researcher gets a activity data- sheet along with the context of occurrence with the entries in the form of tags, consequently solving for both the researcher and the participant.

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2. Introduction

Time is the significant factor governing life. It has become the unit of life. An individual's time is important for him, the family, the society and the country as a whole. The country's economy is largely administered by how, where and with whom the citizens spend their time. Sometime's it is critical for a policy reform, an infrastructural change to understand the time spent. But collecting this data is quite difficult and time consuming by itself. There is a lot of pre and post work that needs to be taken care of along with the data collection. This is done using Time Use Study.

Time Use Studies is the study of data comprising of how on an average individuals allocate time for carrying out specific activities. The time spent on doing an activity and the frequency of the same is measured, analysed and further used for policy formulation on all forms of remunerated and unremunerated 'economic work', on work not considered 'economic' and other human activities.

The Government of various countries conduct Time Use Studies or Time Use Surveys on a large scale in regular intervals and analyse the data. There are dedicated research centres like The Centre for Time Use Research is a world-leading, multidisciplinary research group based in the University of Oxford's Department of Sociology who call themselves 'the lab who knows where your time goes'.

Their surveys also include Multinational Time Use Study (MTUS) and the American Heritage Time Use Studies (AHTUS) [16].

The UN gender time use studies is available in a web portal [14], developed and maintained by the United Nations Statistics Division (UNSD), provides data and detailed metadata for time-use statistics provided by countries. It shows the average time spent on paid and unpaid work in a 24-hour period, by sex for each country with available data as of May 2016. India participated in the year 1999 and between 1966 and 2015, 85 countries have conducted TUS¹ (UN statistics division)[14].

The TUS conducted by India in 1999 is the only big study that was conducted in the form of a pilot study to find the best method for Indian context. The method was of recall [5] and it was a pilot study. But to get data from such a large population is not just humongous but also very time and resource consuming.

The respondents who participate in the Time Use Study also need to devote a lot of time and effort if rich data is required. Since the study is completely based on the willingness of a participant to contribute to this data collection, there is a dire need to make it effortless for the respondent as well as the researcher for conducting a study of this magnitude in a developing country like India.

¹ TUS – Time Use Studies

2.1 Time Use Studies - Background

From the activity based data collected over a period a Time Use Studies can be made. A time-use survey is a statistical survey which aims to report data on how, on average, people spend their time. The data collected using time-use approach provide comprehensive description of lifestyle of individuals, in terms of how they spend their time in different human activities. (Ironmonger, 1999)[\[3\]](#).

The initial efforts of conducting time use survey in India, go back to early 1970s. A study based on a small scale survey was carried out by Mrs. Devaki Jain during September 1976 - December 1977 in six villages – three in Bharatpur district of Rajasthan and three in Birbhum district of West Bengal. In 1983, the National Council of Applied Economic Research (NCAER) conducted a time allocation study on a subsample of Employment and Unemployment Survey 3 conducted in the 38th Round (1983) of the National Sample Survey Organisation (NSSO). A pilot survey on time-use was also conducted by the Directorate of Economics & Statistics, Government of Tamil Nadu during 1996 (CSO, 2012)[\[2\]](#).

Nearly 22 countries have been constantly collecting data using different techniques and analysing them as recently as 2015. India has proposed to do a TUS around 2013 and then again in 2015[\[4\]](#) but there is no data (Rukmini, 2015)[\[1\]](#). There is a huge gap since data was collected last. There is humongous effort required at data collection level and post collection processing level.

The policies and comparative study made in various vast fields, made by countries which record TUS is the primary motivator in collecting activity based data. Also in India the unavailability of data since 2000 and the inaccuracy of the data [\[5\]](#) collected back then (contextual inquiry) calls for an efficient data collection and processing system in India.

Though time use surveys are useful to both developed and developing economies in improving their statistics on labour use and national income; there is a difference between the objectives of time use studies in developed and developing economies. In developed countries where official statistics provide fairly reliable information on market oriented activities, time use studies are used mainly as a source of information on activities not covered by official statistics, such as leisure, household work, family care etc. Time use statistics here are used mainly for measuring unpaid activities performed at home, to analyze the relationships between market and domestic labour, and to serve as a basis for quantifying domestic work in monetary terms comparable to production included in national accounts (Hirway, Time use Studies: Conceptual and Methodological issues with reference to the Indian Time Use Survey", 1999)[\[5\]](#).

3. Secondary Research

TUS has been conducted since the 19th century in varied using different methods for a variety of purposes. Many methods have been proven best for certain contexts. In order to attempt to solve the problem, it is essential to glance through research done across the globe. Through secondary research, I understand what TUS essentially is first and then I analyse the methods used for conducting TUS. By looking into various new articles and papers, I attempt to explain the importance of TUS. Further, the research states which is the best method by far for TUS and adds a few existing variants of the method. There is a mention of current technological interventions and why smartphone is a probable medium for the solution.

Time-use studies typically have a single focus: to study the frequency and duration of human activities. For example, time-use surveys may ask respondents to report everything they did during a 24-hour period along with some indication of the starting and stopping times of those actions. Sometimes there are specialised studies where the test is conducted for a particular purpose, so the questions to be answered or the data to be recorded is also predetermined like in this United States Department Of Agriculture Bureau Of Home Economics conducted in Washington DC (Hussmanns, 1999)[\[7\]](#).

3.1 Time Use Studies

Time use statistics are quantitative summaries of how individuals allocate their time over a specified time period – typically during 24 hours of a day or during the seven days of a week on different activities and how much time they spend on each of these activities - Indira Hirway (Hirway, Equal Sharing of Responsibilities between Women and Men: Some Issues With Reference to Labour and Employment, 2008)[\[6\]](#).

3.2 The Need

There is a wide range of potential uses of data on how people spend their time, including understanding the effects of public policies on individual behavior. For example, low-income workers are sometimes eligible to receive subsidized child care. Time-use data can help in understanding how these policies affect the amount of time that parents spend working at home or outside the home and how much time they spend with their children or elders.

Aside from public policy uses, time-use data can improve our understanding of individual and household behavior, especially with respect to time allocation decisions and in improving our knowledge of the well-being of the nation (Michele Ver Ploeg, 2000)[[8](#)].

Data on time allocation can be used to further understanding of individuals' decisions to work or not work for pay and, more generally, decisions on how to allocate time to different activities (Michele Ver Ploeg, 2000)[[8](#)]. These data are also important for understanding the allocation of time and goods among members of households.

3.3 Examples of Time Use Study :

Secondary research throws light on a few examples of different research based on TUS

- Time Use Statistics provide detailed information on how individuals spend their time, on a daily or weekly basis on SNA activities that fall within the purview of the system of National Accounts, non-SNA activities that fall outside SNA but within the General Production Boundary and personal services that are personal, non-delegable activities (CSO, 2012)[2]. (Figure 1)
- Understand the effect of new technology on the time use of farm homemakers (CSO, 2012)[2], in 1920 by India.
- Understanding the problem of commuting and the length of commuting time, use of mass media by population, leisure time and its use by different socio-economic groups (Ministry of women and child development government of india, 2007)[9]

Activities		Rural			Urban			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
SNA	In Hours	44.83	23.90	34.74	41.81	7.02	25.45	43.63	17.60	31.24
	%age	26.68	14.23	20.68	24.89	4.18	15.15	25.97	10.48	18.60
Extended SNA	In Hours	3.25	37.55	19.73	3.09	41.57	21.18	3.19	39.08	20.27
	%age	1.93	22.35	11.74	24.74	24.74	12.61	1.90	23.26	12.07
Non-Extended SNA	In Hours	119.93	106.52	19.73	123.09	119.47	121.99	121.12	111.52	116.44
	%age	71.39	63.40	11.74	73.27	71.11	72.61	71.10	66.29	69.31

Figure 1 : Time Use Statistics, Weeklyaverage time spent on SNA, extended and Non - SNA activities

Some Policies addressed after conducting Time Use Study:

- Study the gender discrimination in household activities (Wodon, 2006)[[10](#)].
- Work Force Using Time Use Statistics in India and Its Implications for Employment Policies (Hirway, Estimating work force statistics, 1999)[[11](#)].
- Labour Force Estimation and Employment Policies (Hussmanns, 1999)[[7](#)].
- Equal sharing of responsibilities between women and men, including care-giving in the context of HIV/AIDS (Hirway, Equal Sharing of Responsibilities between Women and Men: Some Issues With Reference to Labour and Employment, 2008) [[6](#)].

are identified then they are approached and briefed about the study. In most cases some honorarium is given for their time and support. They are free to sign out at any time and the study is purely voluntary. No personal details are breached. The demographical data, age, time and occupation with respect to time are the most desired parameters of the study (Harvey, 2004)[[12](#)]. Based on the requirement of the study data is collected over 24 hours or more and further analysed to retrieve patterns based on the parameters

The project keeps pre-collection, data collection and post-collection in mind and makes use of insights from these to get key design ideas which are discussed later.

3.4 How a research involving TUS is conducted

A lot of time goes into the preparation of the study itself. The 1999 Study in India almost took an year of preparation (CSO, 2012)[[2](#)], research and followed by post research analysis. The study overall with data analysis got completed in 2000.

Most research involving TUS need a large number of participants or is done keeping households as the unit. Once the type of participants

3.5 Potential Threats

Whatever the method be, there are a couple of threats any project of a large magnitude will encounter. I try to address these potential threats that researchers generally encounter.

Four of these disadvantages are outlined below, along with the way in which the researchers overcame the potential disadvantages (CTUR)²[16] :

1. “Representativeness – to what extent does such a demanding research tool put potential participants off, creating a sample more biased than would otherwise have been the case?” As the participants for this project were purposively selected (i.e. were not a random sample) this was not an issue as we recognised that the participants represented those who were sufficiently interested and self-aware to want to participate in this kind of study.

2. “Difficulties – are some participants unable to complete the diary due to visual impairment, problems of manual dexterity or limited literacy skills?” This was able to be assessed during the first interview, and accommodations made for any difficulties that were presented.

3. “Quality of data – how consistent, adequate and accurate is the diary as a record of daily events and actions?” Validity in terms of qualitative research is often a subjective measure best judged by the researchers concerned and their referees. However, best efforts were made during the research design phase to ensure integrity. Hence the adoption of Zimmerman and Wieder’s (1977) diary-interview approach in order to ensure the highest possible data validity – including the ability to confirm and explore data during the second interview.

4. “Ethical considerations – does the completion of a diary, and all that goes with it, cause undue distress, anxiety or inconvenience?” Again, this could be addressed when the diary was introduced during the first interview. At no point was it communicated that the diary completion was a compulsory.

3.6 Classification of Activity

There is a list of activities that covers most activities humans involve themselves in which comprises of both paid and unpaid labor. Most researchs use this classification which is agreed upon by a special government team. Special studies let respondents input their own activities as they write but there is a lot more time lost into

² Centre for Time Use Research

analysing such data. Thus there is a broader classification that is coded and can be easily combined and analysed.

The secondary research gives the glimpse of the broader category of activities (refer appendix 1).

1. Primary Production Activities
 - a. Crop farming, kitchen gardening, etc.
 - b. Animal husbandry
 - c. Fishing, Forestry, Horticulture, Gardening
 - d. Collection of fruit, water, plants etc., storing and hunting.
 - e. Processing & Storage
 - f. Mining, quarrying, digging, cutting, etc.
2. Secondary Activities
 - a. Constructing activities
 - b. Manufacturing Activities
 - c. Trade Business and Services
 - d. Services
3. Household Maintenance, Management and Shopping for own household
4. Care for Children.the Sick, Elderly and Disabled for own household
5. Community Services and Help to other households
6. Learning
7. Social and Cultural Activities, Mass Media, Etc
8. Personal Care and Self Maintenance

3.7 Methods used for TUS

The activities are collected from respondents via different methods. Decisions concerning reporting procedures and mode of data collection may influence data quality (Stinson, 1999)[13]. India in 1999 did a recall method where each respondent was asked to recall his activities for the past 24 hours. The problem with this as mentioned by Indira Hirway [5], is that when the respondents choose from a list of activities they did the previous day it is more likely to not be accurate. There is a high possibility of fudging. Also lot of man hours were spent into this collection since it was a door to door recall survey method.

Survey types - data collection methods used so far (UN statistics division) [14]

- Pilot - self complete diaries
- 24 hour Questionnaire
- 48 hour full diary
- 24 hours diary
- Household surveys
- Diary(for educated respondents and face to face interview for uneducated respondents, a weekend day and a weekday were covered)
- Questions

- Diary sheet included in the household survey
- Recall Interview - India

The best method to collect data as proven by different researchers is the Time Diary method. The recall method is not the best but the advantage of this method is that it consumes less time to recall and write rather than spending an entire day writing diaries.

3.8 Time Diary Method

Time diary by far is the mostly widely used method for time use data collection. As the name suggests respondents are given with books with columns to fill as they carry out activities [8].

The diary started with activity logging but as time went by, it has evolved. The diary collects context along with the main activity. Besides the elapsed time in a certain domain, we may also want some characterization of the activity, such as attributes of a spell of time or information on the timing of external events or transitions from one activity or state to another. The purpose of such measures is to construct variables which capture the level of designated time allocations and responses for the purpose of understanding behavior in the context of a model (Kalton, Graham. 1585.)[19]

The context comprises of secondary activity which a respondent did while performing the primary activity, location of occurrence,

participants who were involved or with whom the activity was done and whom you were doing the activity for. People do not engage in just one activity at a time. They focus is on one at a time but Humans always do simultaneous activities (Sullivan, 1998)[17]. Samay Lekha tries to collect context along with the activities so there is description of the data by itself.

Condensed activity list is as follows

- Personal care activities
- Employment related activities;
- Education activities
- Domestic activities
- Child care activities
- Purchasing goods and services
- Voluntary work and care activities
- Social and community activities
- Recreation and leisure
- Travel time

The list of suggested locations [17]

- at respondent's home
- at workplace
- at someone else's home
- at other place (includes park, neighborhood)
- Or in transit:
 - in car (driver)
 - in car (passenger)
 - walking
 - in bus or subway (includes streetcars, commuter trains)
 - or other public transit)
 - on bicycle
 - other (for example, airplane, train, motorcycle).
-

Whom were you with categories

- Alone
- Spouse/partner
- Child(ren) of the household under 15 years

- Parent(s) or parent(s) in-law in the household
- Other member(s) of the household (including children
 - ages 15 or older)
 - Child(ren) of the respondent less than 15 years old
- outside the household
 - Child(ren) of the respondent, 15 or older outside the
 - household
- Parent(s) or parent(s) in-law outside the household
- Other family member(s) outside the household
- Friend(s)
- Other persons(s)

A verbatim description of the day's activities is collected along with an assignment of the approximate starting and stopping times for each activity, recorded either in free format or in fixed 5- to 10-minute intervals [17]. (Figure 2)

For the design Samay Lekha this was an interesting insight. Samay Lekha borrows from the idea of Time Diaries and also **recall** method to strike a balance between content and time taken to record activities.

Day 1

6 a.m. 9 a.m.

	1 What was your main activity? (Please record all activities, even if they only lasted a few minutes)	2 Who did you do this for? (e.g. self, family, work, friend, a charity, the community)	3 What else were you doing at the same time? (e.g. childminding, watching television, listening to the radio)	4 Where were you? (e.g. at work, home, on a bus, driving a car)	5 Who was with you at home, or with you away from home? (e.g. no-one, family, friends)
6:00					
.05	Sleep	Self	Passive child care	Home	Family
.10					
.15	↓				
.20	Toilet				
.25	Had shower				
.30	↓				
.35	Got dressed	↓			
.40	Put on a load of washing	Family	↓		
.45	Made breakfast		Talked to family		
.50	↓		↓		
.55	Ate breakfast	Self	Read newspaper		
7:00					
.05	↓	↓	↓		
.10	Hung washing on line	Family	Nothing		
.15	↓	↓	↓		
.20	Dressed children	Children	Talked to children		

Figure 2 : An example of a time diary used by the Australian Bureau of Statistics (Stinson, 1999)[17].

3.9 The use of Technology for data collection

The time diary has been in existence since quite sometime and seen many evolutions. One such is hybridisation where respondents are asked to fill the diary in a digital format based on their convenience. It comprises of a traditional paper pen diary, a mobile diary and a web diary to be used from computers (Harvey, 2004) [12]. Participants based on their expertise and availability record data in one of these modes and send them across. But the analysis is difficult in this case as post collection is again time consuming. Oxford centre gave its respondents a pendant to wear which had a guinea camera and clicked 3 pictures of the activity in front of them per minute. They also had acceleration tracker on it to see how rushed a person is actually in comparison to what he claims to be. What the study did was prove that time diary method is the best method for time use data collection. Since both the data were almost similar in most cases (Pearson, 2015)[18]

Reminder

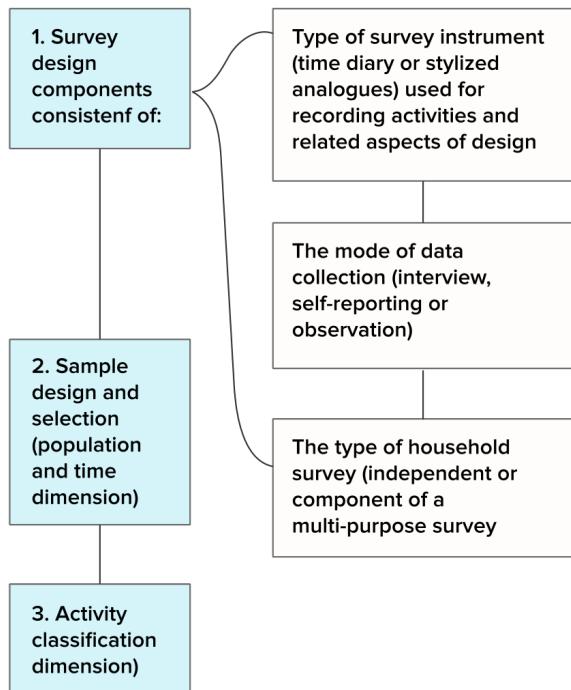
But further interventions are of probe. Where respondents are given diaries but also reminded time to time and the participants highly benefitted from this since the cognitive load reduces through the day (Stinson, 1999)[17]. This was done by giving them a buzzer like pager or called at intervals and reminded to do data entry.

Probe

Hybridization, automation can provide probe at the right time. Asking questions while filling probes to fill correctly (Stinson, 1999)[17]. Contextually while filling the data if right questions are asked, it sets the line of thought in the desired direction. Based on previous activity, location time, etc., different type of triggers can be sent. Technological intervention here makes the life easy for the researcher as well as the respondent.

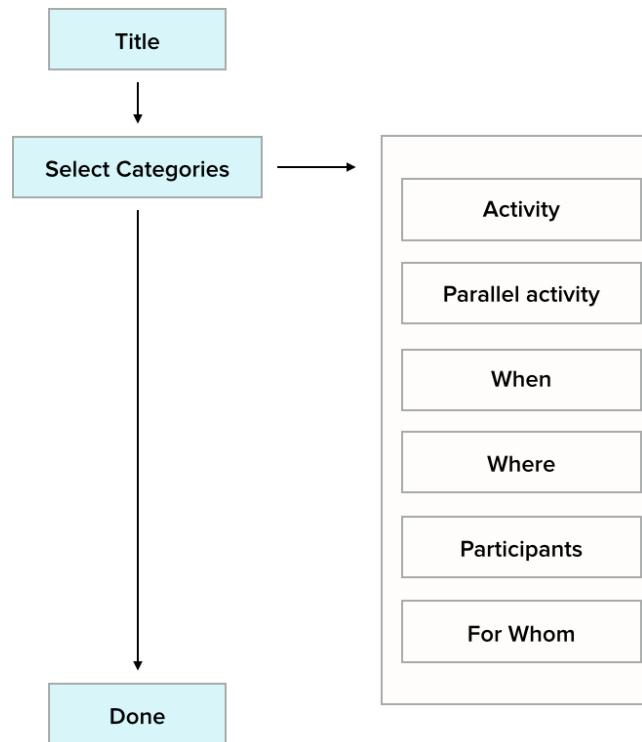
4. Early Design Ideas

The tool to collect Time Use Data needs to be able to assist both the researcher and the participants. Only if the participants find it effortless and seamless to give details of their activity through the day and sometimes more, will the research itself be possible. The collected data needs to be in a format easy for analysis so the work involving post data collection is less time consuming.



The Categories of data collection also need to be pre decided in order to make it more like a selection from a list process rather than writing details down.

Keeping the fast life of India in mind as well as the literacy levels, a list of categories with options to select from would work best to select the from, rather than write pages of data.



Respondent in a day is doing multiple things and yet must be able to record his activity and time without causing much of a hindrance while being busy. Tags for activities and their icons might be a good way to help them select on the move.



Personal Care



Cooking



Exercise



Travel



Child Care



Work

I intend to use the list of activities as mentioned in A time-use survey design by Linda L. Stinson, and classification as per the government used in 1999 study and mentioned by Indira Hirway.

For Time Use Study, it is important to address the fact that a participant needs to record activity or remember it as granular as 5 minutes and sometimes it is not possible and a reminder or probe will be really helpful. The reminder has a friendly language to engage the respondent in a conversation.

For whatever level of accuracy one may reach, still more minute observations could possibly prove that some activities which seemed to be carried out simultaneously were in effect alternating with one another; or that some activities which seemed to be performed consecutively were factually overlapping to some extent.
- Alexander Szalai

Capturing simultaneous activity and context by the respondent is asking him or her a lot of time using the tool itself. In order to combine all the features a solution involving a smartphone is the best in this context. The tool makes this easy and less cumbersome by including location feature and smart collection of possible parallel activity like phone usage or call log. People have started using smartphones easily and can also be trained to use one if the interface is just picking from a list of options [19]

2019 - 2.7 B Smartphone Users (write in lakhs)

With so many people already using smartphones and with the projection the solution is a smartphone based tool that will combine all possible technological interventions and

5. Primary Research

Samay Lekha is based on Time Diary method which is from secondary research. The Time diary itself is done in many ways. Most methods require user to enter every activity through the day in columns. The traditional paper pen method, Diary on computer or phone and the recall diary method was tested to decide on which method to use in the tool.

5.1 Respondents

In order to test the methods Respondents of varied age groups from different educational and occupational background were approached. The purpose of the study was to find out patterns from the way Respondents entered data and this was followed by an interview. The names of the Respondents are kept confidential.

A total of 12 Respondents recorded data for 48 hours and were free to choose the method as per their convenience and the data were entered every time an activity was performed.

User Id	Gender	Age	Occupation
U 1	F	52	Home Maker
U 2	M	54	Banker
U3	F	27	Student - Engineer
U4	F	25	Student - Designer
U5	F	24	Student - Designer
U6	F	24	Student - Designer
U7	M	24	Student - Designer
U8	F	26	Student - Designer
U9	M	26	IT Professional
U10	M	59	Retired Marketer
U11	F	24	Marketer
U12	M	24	Coder

5.2 Testing different methods

The data was collected over a weekday and a weekend in order to get a glimpse of both since the same person does significantly different things during these two times. Few respondents did a combination of methods by trying the traditional diary method and then fill data online on consecutive days. They recorded most of the data online on the data sheet, but while travelling they came back and noted data down for the past hours.

Traditional Diary Method

Respondents were briefed to note time whenever they do an activity. The format was shared and they were all briefed.

12:00 - 1:30 - coffee with friend.
1:30 - 2:30 - return from HN travelling.
2:30 - 3:00 - talking to 2 friends
3:00 - 3:30 - washing clothes, room cleaning.
3:30 - 5:00 - ~~reading~~ chatting with a friend,
laundry, toilet.
5:00 - 6:00 - Tiffin.
6:00 - 6:45 - working, watching videos for work,
downloading music.

U5, weekend

9: sleeping	self	nothing	room	no-one	5:15	tiffin	self	MEN	Shrey, Naz, Ayan
12: Toilet	self	nothing	Toilet	no-one	~5:50	walk	Shrey + HII	talk	Shrey
12:15 work kitchen	self	whatsapp/ facebook/ music	Room	no-one	~	Whatsapp	Self	whatsapp	Room
1:45 Brush	self	nothing	washroom	no-one	1:45	IACT	app		
1:54 Lunch	self	thinking, whatsapp	mess	Ajmaa + Naz	7:30				
~ canteen buying bananas	self	not talking	canteen	Ajmaa + Naz	~7:40	Ginger	self	talking	men Ayan Naz Shrey
~ (LUNN, TSH)	self	nothing	Room	no-one	~7:45	water	self	water	Kum
3:45 talking	?	filling this form Drawing Talking on	Room	Shrey ~ Ayan	~8:00	coffee	self	coffee	

U4, Weekend

Online Diary

The format was made on Google sheet and each Respondent had access to a sheet. They updated whenever they could from either their phones or laptop, since internet is not mandatory to fill data, it was convenient and the data synchronised automatically when connected to an internet source

Day	Time	Activity	Parallel activity	Whom are you with	Where are you
15-Sep		sleeping		No One	Room
15-Sep	8:30 AM	wake up, get ready	wake up others	No One	Hostel
15-Sep	9:00 AM	breakfast	nothing	No One/ People in mess	Mess
15-Sep	9:25 AM	Auto to class	talking	Dixa, Shreya	Road Insti
15-Sep	9:35 AM	Statistics class	class related stuff	Classmates	Sr IxD

U4, weekday

Time	What was your main activity?	Parallel activity	place	Participants	problem faced
6.10 am	saw baba picture in mobile. Lying in bed--browsed messages	thinking about office	home	wife	restless from the morning as I have to jot down meticulously
6.30 am	Got up frm the bed. Looked through the window and saw temple tower and woshipped	nil	home	none	
	toilet				
6.45 am	saw messages in moobile	nil	home	none	

U2, weekday

Recall Diary Method

Respondents entered data 24 hours after the activity was performed. The format was same as the format followed by traditional time diary method.

Whom are you with	Where are you	Difficulty
Self	Room	Unable to recall exactly when I woke up
Self	Bathroom	
Self	Bathroom	
Self	Laundry room	
Self	Corridor	
Self	Room	
Self	Room	Approximated
Friends	Mess	Not sure
Self	Insti main road, outside	
Self (People at the temple)	Temple	Do not remember time

U8, Weekday

Whom are you with	Where are you	Difficulty
Self	Hostel Room	can't remember exactly when I woke up, must be after 0545 and before 0600
Self	hostel washroom	
Self	Hostel Room (virtually dharavi)	
Self	Hostel Room	time mentioned and taken for the task is approximated to nearest standard time and not precise
Self	Hostel Room	
Self	Hostel Room(virtually dharavi)	

U7, weekend

Self	Home	
Self	Home	Had difficulty in recalling what I was doing.

U2, weekday

5.3 Interview with the respondents

After the respondents completed data entry for 48 hours, there was a follow-up interview session. Respondents from different backgrounds who are currently students but have pursued architecture, engineering, design, banking, journalism were interviewed individually.

First the interview was an overview of the method they had chosen, then a discussion with the data entry sheet was done in order to look into each aspect in detail.

A detailed interview with each respondent lead to key findings, discovery of problem in the current system in this context and certain observations. An analysis of the same was done for design ideas of Samay Lekha. Through the design ideas from the identified problems, I attempt to address each of the key findings. The interviews were written down while discussing in shorthand and transcribed on to small bits of papers with one statement or observation on one piece.

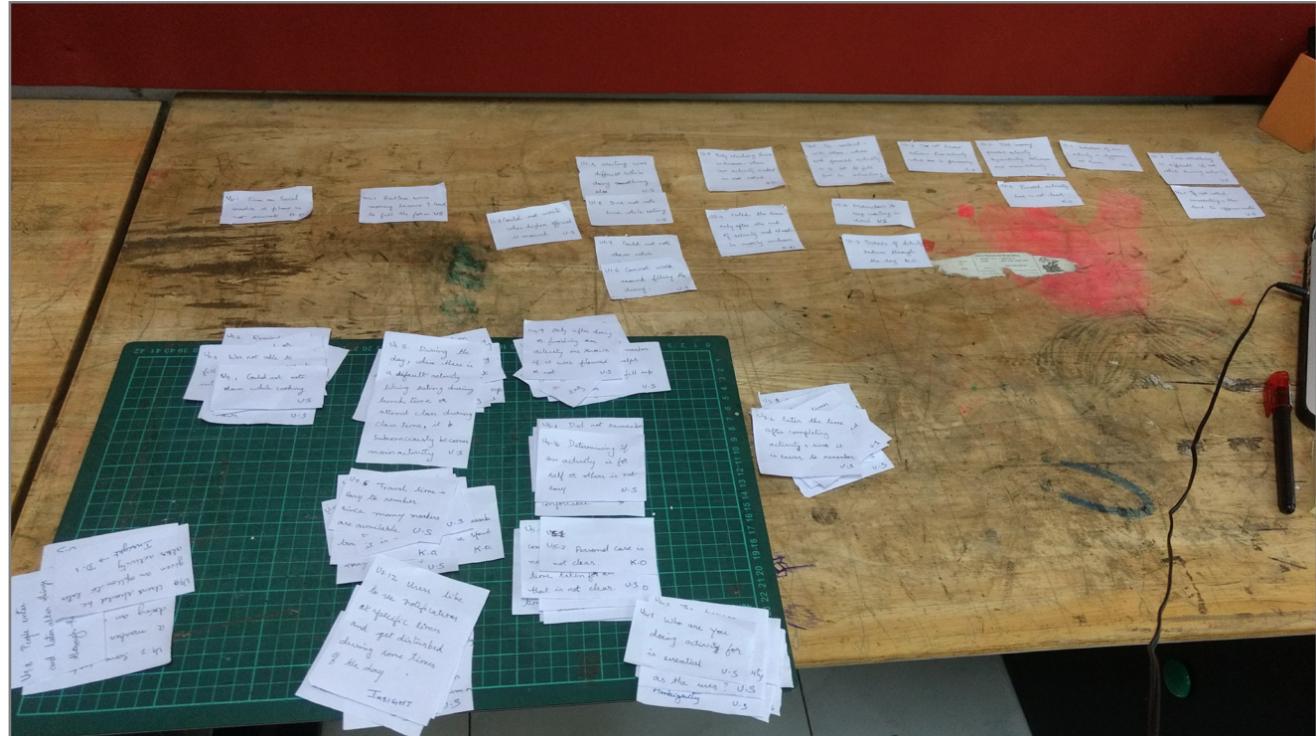
5.4 The Interview

The interview comprised of predetermined questions to set the respondents talking and discuss a line of thought. Not all respondents were asked the same questions and the order also varied according to the nature of data entered. The respondents were asked these questions

1. Have you ever used any data entry app before
2. When did you start entering data
3. What was your motivation to enter data
4. How convenient was it for you to keep entering data through the day
5. Will you want to use this method if you had to enter data for a week
6. What Problems did you face while recording the time
7. How did you note down the start and end time of an activity
8. When during an activity did you note the time down
9. How long did you spend in filling the data sheet
10. Did you fill in from laptop or mobile (not for respondents using traditional methods)
11. If not noted during an activity then when did you note it down
12. How long after an activity are you able to remember the details of it.
13. If the google sheet or diary is not available, how did you fill
14. How did you remember an activity later. Was there a way to remember.
15. Did you find it easy to mention the parallel activities
16. Did your behaviour change after seeing what you have done through the day
17. Did you feel monitored
18. Did company of other people influence your data entry
19. Where you you concerned about other people getting a glimpse of your data which is personal
20. How did you feel while filling the time diary

5.5 Affinity Mapping

To make an affinity map, all user statements were written down first and then every statement was transcribed on to single small sheet.



The participant statements were spread on a table and scrutinised for patterns

The important statements were highlighted, grouped together based on statements which were closely associated with each other with specific titles for further reference.



From the titles given to groups another set of affinity mapping was done to exactly identify the problems. In the order of priority, these were arranged and highlighted



5.6 Insights

Each respondent filled the sheet in a different way as per his or her convenience since it was left to them. Most of the diaries had granularity of at least an hour with respect to time. Two of them had not written context (location, other participants) in a separate column. Discussed next are from observations and respondent statements.

- Recording time while doing an activity is difficult
- This was a rather important finding which had a small complication. Most respondents felt noting down time while doing an activity is difficult but if not noted while doing then recalling is difficult.

"If you don't write when you don't have time for it, you won't write when you do have time for it." – Katerina Stoykova Klemer.
- While socialising with people can not do data entry
- There are many circumstances where the respondent is unable to jot down the details of what he or she is doing since they maybe engaged in a conversation with someone and more so while in a meeting.

participants	could not carry the sheet to clas as it is difficult to write while handling class
none	
none	could not jot down as talking to higher official

U2, Weekday

- Noting time or entering data difficult during travel
- While driving or travelling, it becomes cumbersome to take out the laptop or even the phone and fill in all the columns but
- Travel time easy to remember and acts as a marker
- The travel time is generally easy to remember because there are default markers with respect to travel like the tickets or messages or the time one enters his or her workplace.

- Markers of sorts help recall

Whom are you with	Where are you	Difficulty
self	Hostel Room	cant remeber exactly when I woke up, must be after 0545 and before 0600

U8, Weekday

- During such times when in a meeting, or travelling some sort of a marker for the self becomes useful which can be later used to recall
- Most data entry happens after finishing an activity
- Notification in the form of a reminder to do data entry helps
- Reminders or timely notifications in the form act as a trigger since it is but natural for humans to forget while they engross themselves in various activities through the day

UIC student centre	Had difficulty recalling parallel activity
--------------------	--

U3, Weekday

- Parallel activity time is not easy to remember
- Many a times, one does activities simultaneously and even if time for the primary activity is noted, the secondary or the parallel activity is generally very confusing since it overlaps most of the times.

- Writing a lot of details is time consuming
- When data goes wrong and need option to edit.
- The activities are coded and made into tags which becomes convenient for the researcher to analyse.
- Media time is never accurate
- Since media has become second nature to human beings, it is never accurate when asked to self assess the time spent on any sort of media. - Alexis Ohanian [23]
- The feeling of being tabulated makes respondents restless

who was with you	problem faced
wife	restless from the morning as I have to jot down meticulously

U2, Weekday

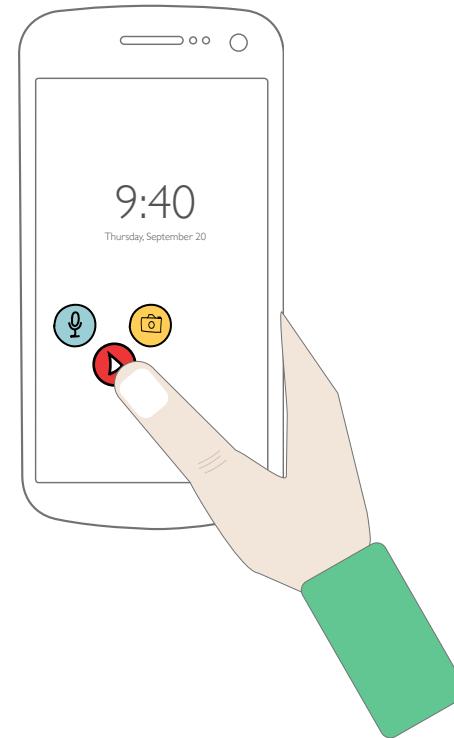
- The very structure of the Time Diary being that of a tabular column, people continuously feel observed and tabulated. Also through the day being able to see the activities done, people tend to change their activity in order to make the best of the day which is not the focus of the study. Then the data get manipulated.

5.6 Design Decisions

Based on the insights, observations and key finding design decisions were made. One main finding was that carrying a laptop or a diary around was not possible at all times as much as maintaining one was cumbersome. The solution is a smartphone application with features based on design decisions as listed below.

Difficult to record during an activity but if not recorded can not recall later

Reducing the interactions to only a single action. Just a start and stop so the respondent is not hindered while performing an activity and concentrates on the work at hand instead.



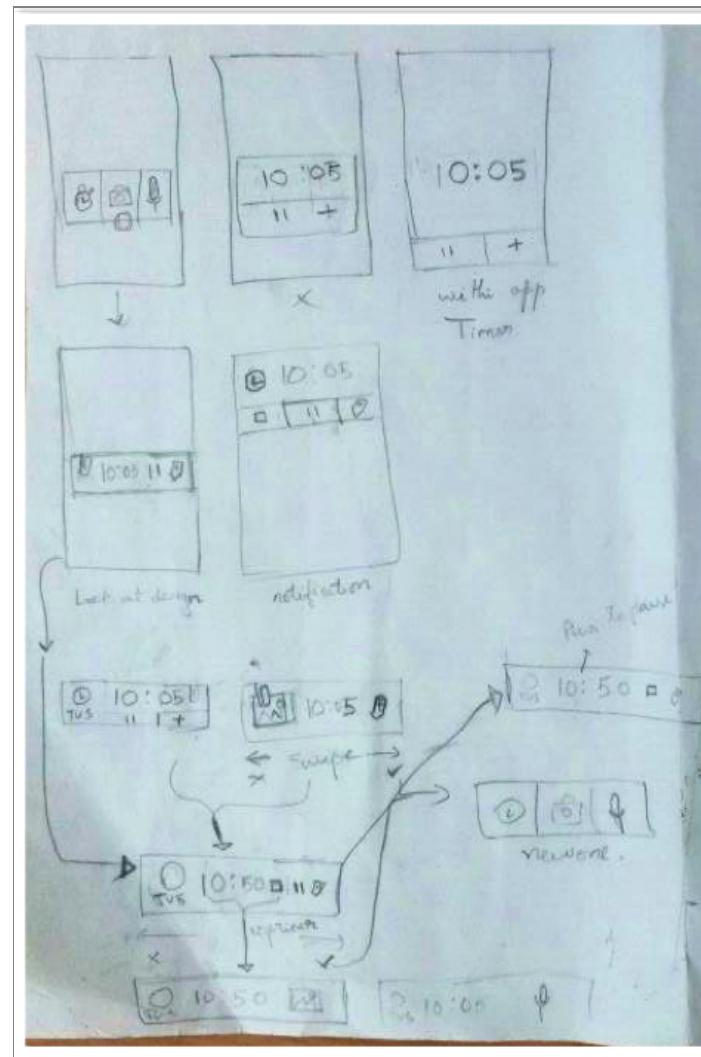
The single touch to start button should also be accessible very easily and each participant should be able to move it around and position as per requirement.

Details of an activity is marked after the completion of it

Most participants filled details after finishing an activity though provisions for entry in between is also there.

Data entry is not difficult, but measuring time is difficult

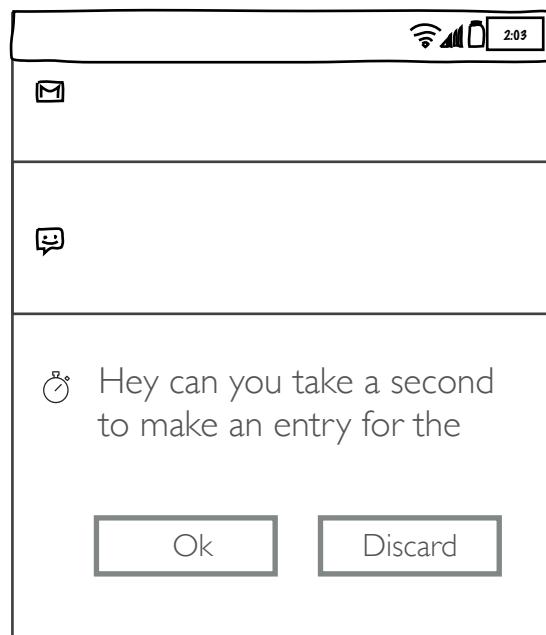
A timer to calculate time, start and end of an activity to reduce the cognitive load on respondents



Timer Exploration

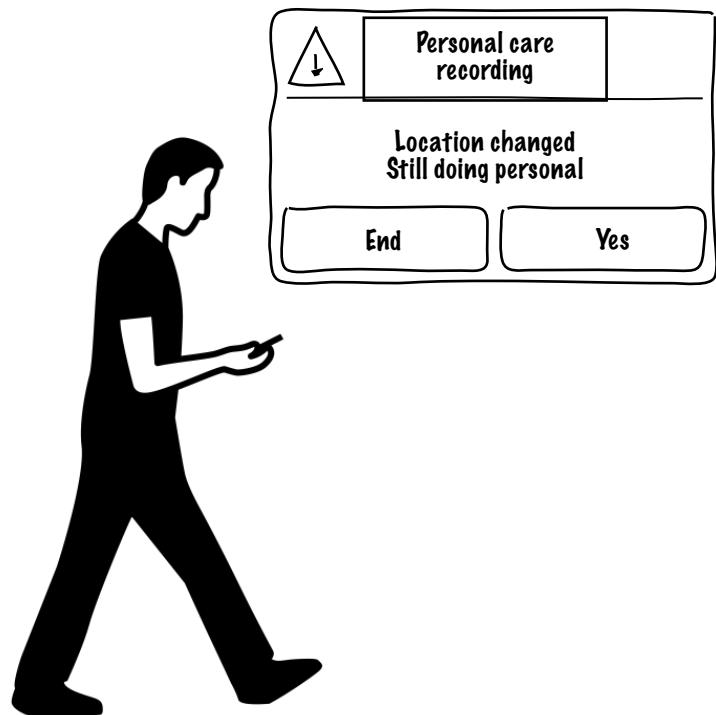
Reminder (probe) helps

A notification every one hour which acts as a reminder will help participants remember that they need to enter data.



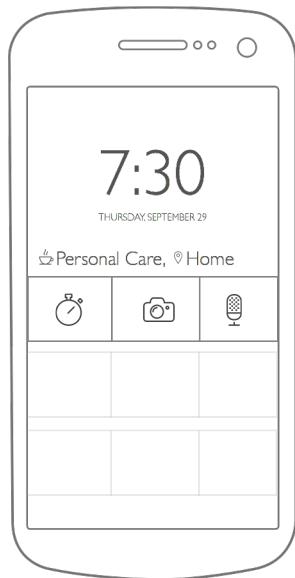
Recording time while travelling is difficult but travel acts as a marker for recall later.

Based on location there come markers attached to activity and that sends smart notification for respondent to remind him of data entry as well as what the activity itself was.



A marker of sorts helps recall later

The tool gives provision for recording while doing an activity but a recall option later by allowing for markers



There is provision for multiple input methods where the camera and microphone of the phone is utilised to add quick markers (explained through scenario in the next section titled Scenarios) These markers act as reminders for later doing data entry at a convenient time chosen by the respondent (explained below)

Context Awareness

Location, time of the day, day of the need not be filled by the participant. The time spent on media or a call can also be captured by the tool. With location comes markers which can automatically remind an activity.

When should I not disturb you

10:00 am ▾ to 12:00 pm ▾

Your current location

📍 34, padma nagar, Baroda ⌂

Make this

*keep GPS on for auto

Home
College
Hostel
Mess

While setting of the tool the participant can mention the time when he or she does not wish to be disturbed, so the tool only sends notifications accordingly. All the notifications and probe are in a humanist tone for a conversational feel

Salient Features

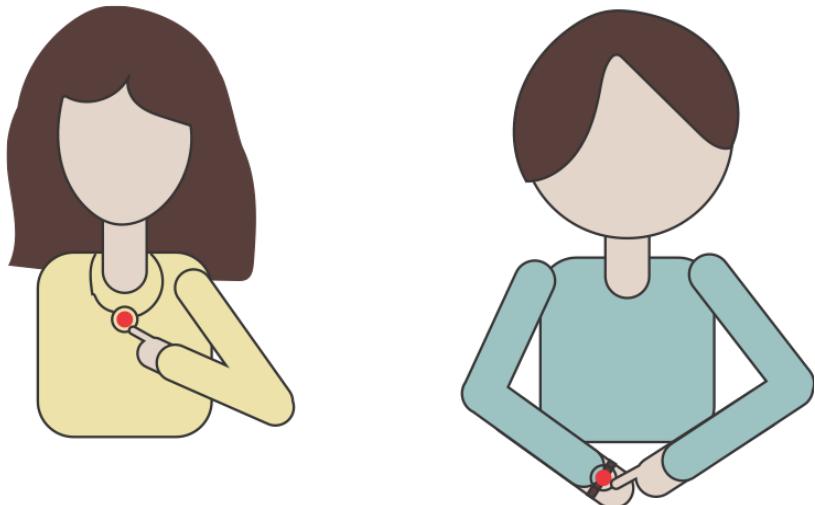
- Context aware tool for collecting time use data.
- With context, switch a lot of the thinking process to the phone (app), so that users never have to tell the app things it already knows.
- Reduce the interactions (respondent uses it many times a day) and make the interface easy to use
- Hide the table so the respondent does not feel tabulated ever
- Never show the user all his day's data at once so that he does not manipulate data

6. Design Explorations

The design decisions were explored in three ways and one of them is the final design for Samay Lekha. Keeping the focus intact in all the explorations as a context aware tool, which makes time use data recording effortless, the strategy remains the same while surface level explorations were done as shown here.

6.1 External Trigger

The idea was to take the trigger to start the timer with a single click operation out of the smartphone or any device. The trigger is a small button that can be affixed on a watch or a pendant thus enabling the respondent to just wear it all day long and the trigger is just a press.



Pros

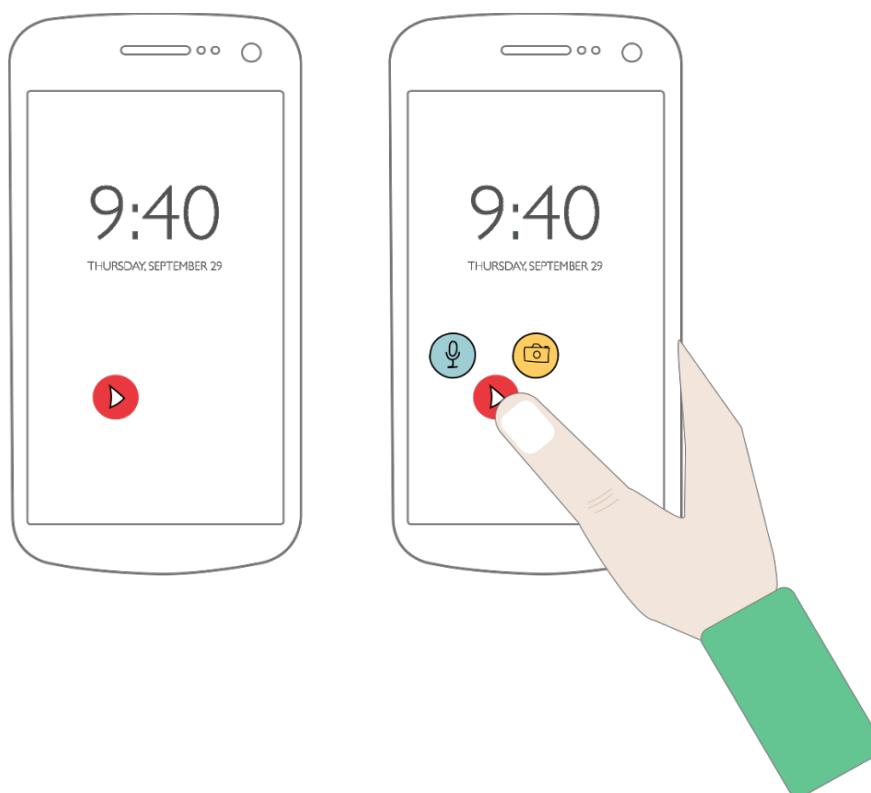
- Single action interaction
- Does not require to fish out the phone
- Triggers a timer on first press and the second press stops it
- Connected to the app and time gets logged

Cons

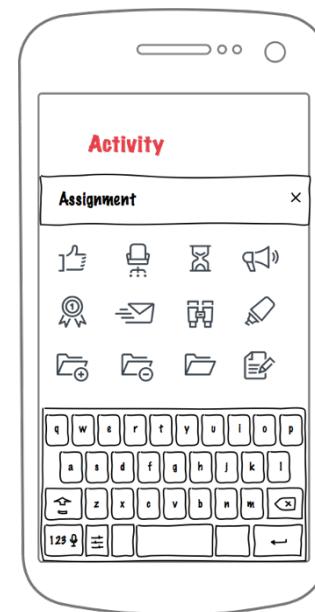
- But no way to mark the activity so one would not know what a recorded time represents.
- Phone needs to be in proximity to stay connected

6.2 Single button timer - press and hold for options

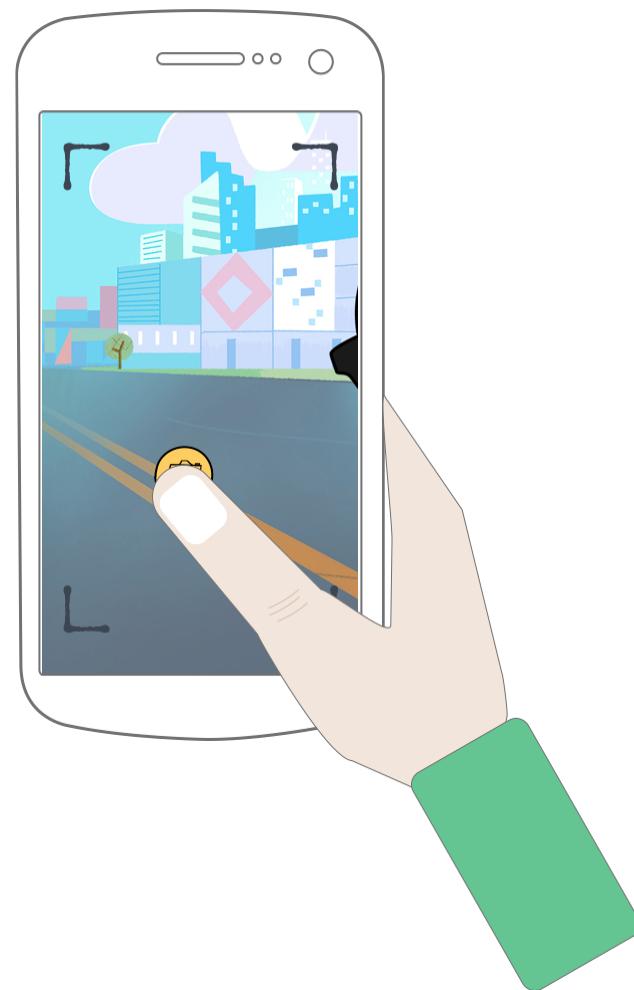
This design exploration is more like an initial stage for the final design where most of the app flow did not change. What changed is the one button trigger which is important for the tool as it is a design idea for a key finding. The idea is to have traslate the external trigger onto the smartphone.



The single trigger button can be placed anywhere the respondent wishes to. When one starts an activity, he just needs to long press it and he gets two options to choose from. One is the camera and the other is the microphone option. If nothing is selected, just the timer starts. All three options start the timer.



Once the timer is turned off there are options to choose from. The activities are in a dropdown list which on choice gets added as a tag to the time recorded.



Further the camera allows the respondent to quickly click a picture [18] of the activity in front of him or anything that can act as a reminder later. Similar is the function of a recorder. The main idea is that if the respondent has time, he or she will update all details then but when on the move they can make use of the quick camera and mic options.

Pros

- Less interactions with the phone
- It is easy to learn to use the application
- Reminders can be easily added
- Activities is a list from which selection is easier than typing them out

Cons

- The options are not visible upfront
- Certain interaction may hide the options

6.3 Timer on a Widget

The third exploration is heavily borrowed from single button timer exploration. This is the wireframe of final design which is explained below through a Scenario

Design Flow through a scenario

Research



The performance of math department in a top university suddenly drops while all the other department perform well. Concerned, they talk to the students and the students feel very stressed and rushed.

They felt busy all the time and could not perform well and the university conducts a Time Use Research on the students of mathematics department to see when the students actually were pushed too much and where they needed an alteration in the schedule.

Researcher



Researcher Sundar decides the number of students he wants for the research. He prepares for research by deciding the categories, parameters and number of days for research. Sundar then send out the app to students and briefs them about the research after which volunteered students install the app.

Respondent



Pankaj downloads the app and installs it and gets a warning about the data that is going to be collected and assures confidentiality. He agrees to record time for the research and goes through the app tutorial.

When should I not disturb you

10:00 am ▾ to 12:00 pm ▾ ⊕

Your current location

📍 34, padma nagar, Baroda

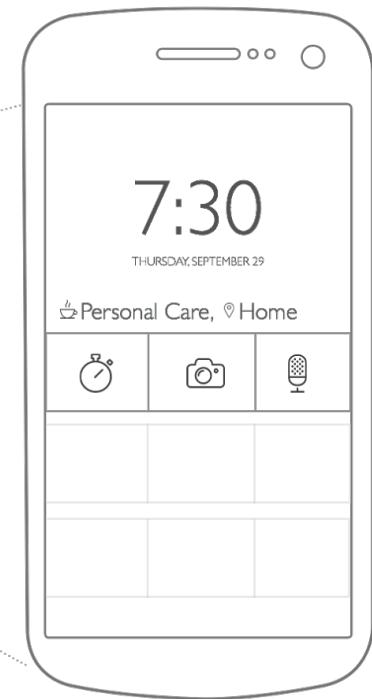
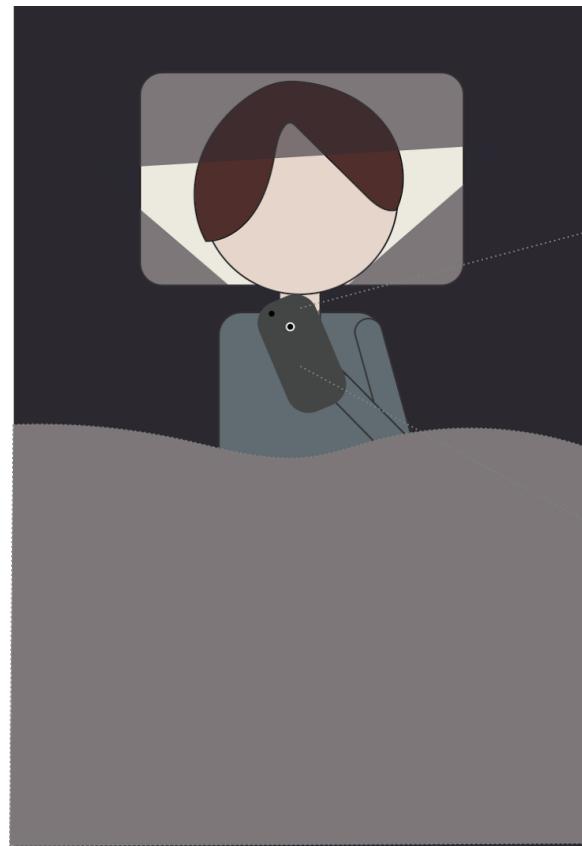
Make this

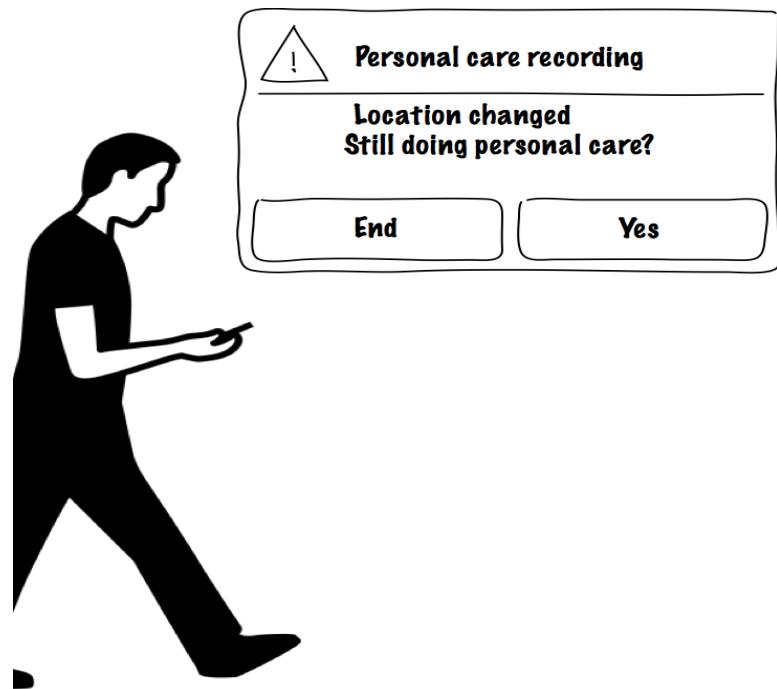
*keep GPS on for auto

Home
College
Hostel
Mess

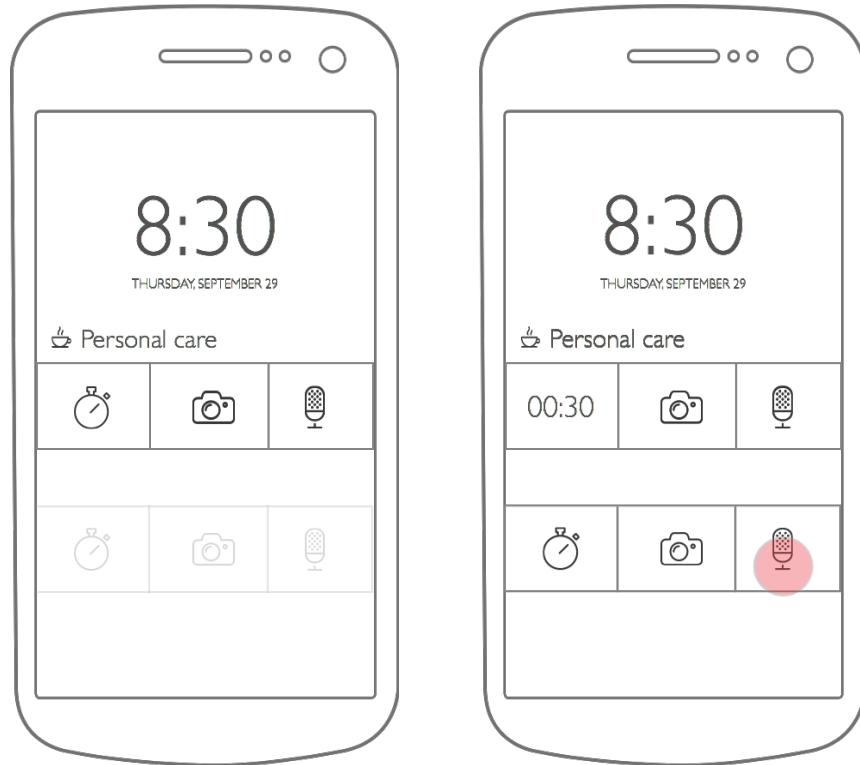
A few initial setup to give better reminders and markers.
The time when Pankaj attends class is set for do not disturb and he sets up location.

He wakes up in the morning and turns off the alarm. There is a widget that is there on his homescreen that shows personal care since he is likely to do that then but this list gets better with history for respondents who sign up for week and more. The location is also tagged since he set it home in initial setup which can be changed later.

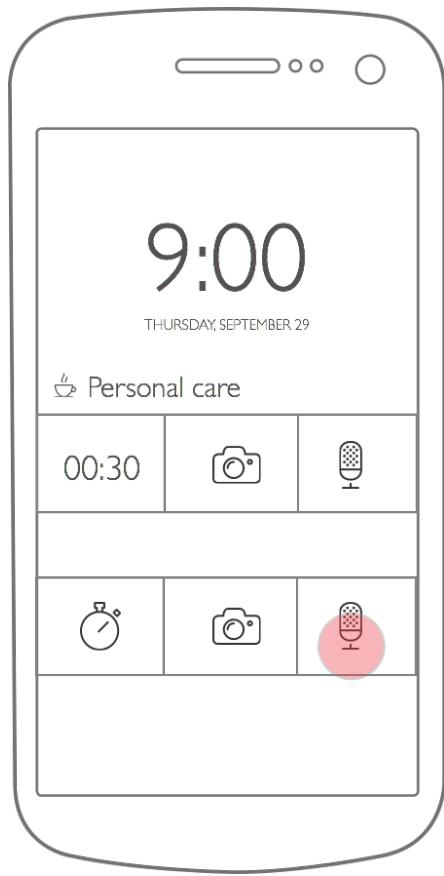




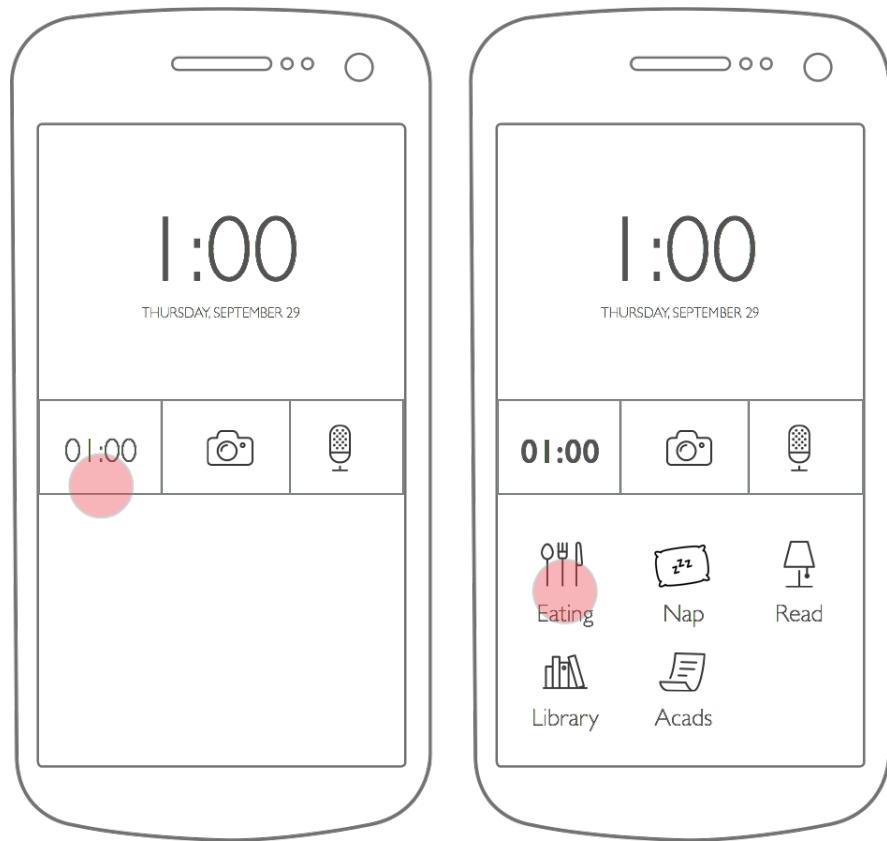
He finishes his personal care and goes out for a walk. After stepping out and not turning the previous timer off, the Pankaj gets a reminder asking him if he has changed activity



He comes back and continues personal care for half an hour

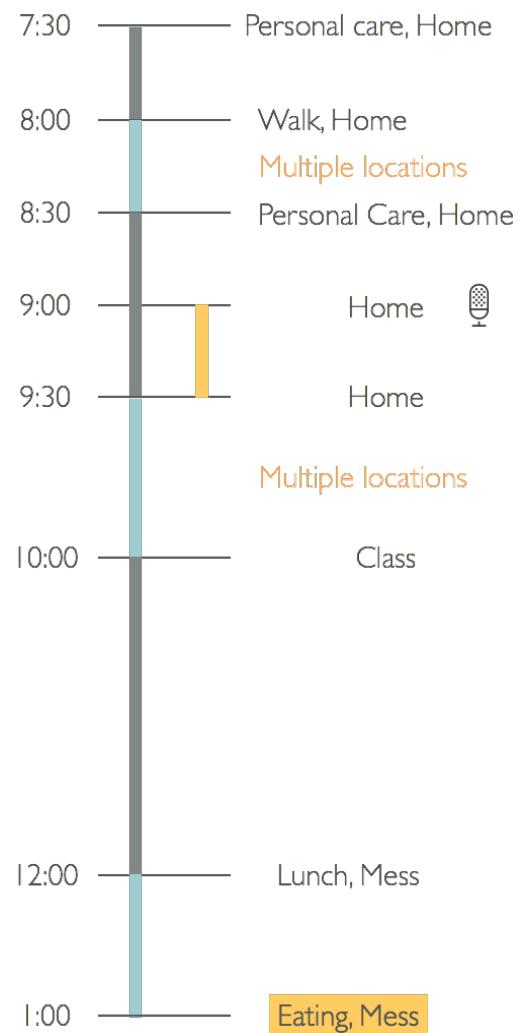


A second widget becomes active after the first timer starts to add parallel activity. Pankaj selects microphone option and adds a marker for the activity he is doing



Once the timer is stopped a drop down menu with the activity list sorted according the time of the day appears. Since it is 1 pm the 1st has eating on top.

A timeline is made with data from timer and the tags added.



From 9 to 9 30 there is a voice message and since it is a parallel activity it is added parallely and the last activity eating gets added when selected from the list.

7. Feature Testing

In order to make this effort intensive process of data entry seamless with the daily routine of respondents, the design decision of Samay Lekha a lot of features. There are multiple input methods for recording time, which was based on Respondent interviews. Through feature testing, the validation of different features is explained below.



The test required respondents to be able to try camera option, voice record option and the advantage of being notified to see how these input methods benefit them and how frequently they use them. Since whatsapp has all these features embedded in chat option, this was used to test the features.

A whatsapp group with me and one respondent was created for every respondent. Every time the respondent does an activity they were briefed to make an entry. And they were free to use the camera or microphone to assist them.

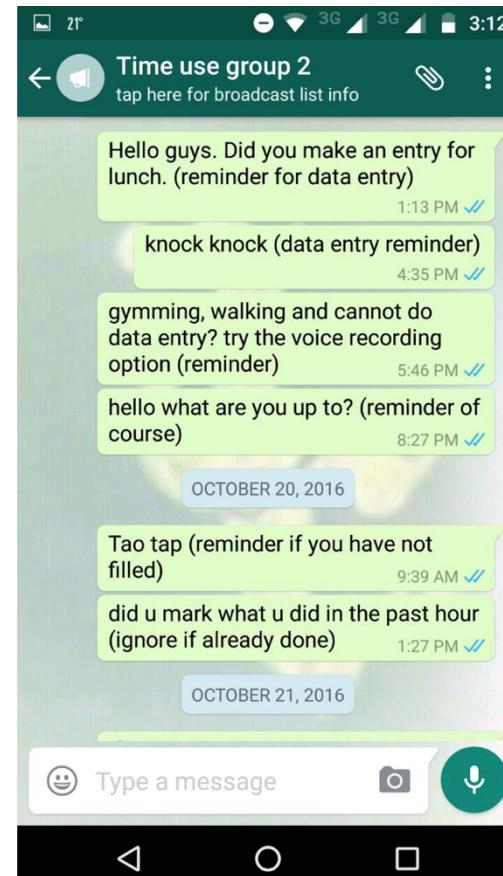


An icon of a clock to identify that this is a Time Use Study group was also added. Each groups were names as Time Use with followed by the respondent's name.

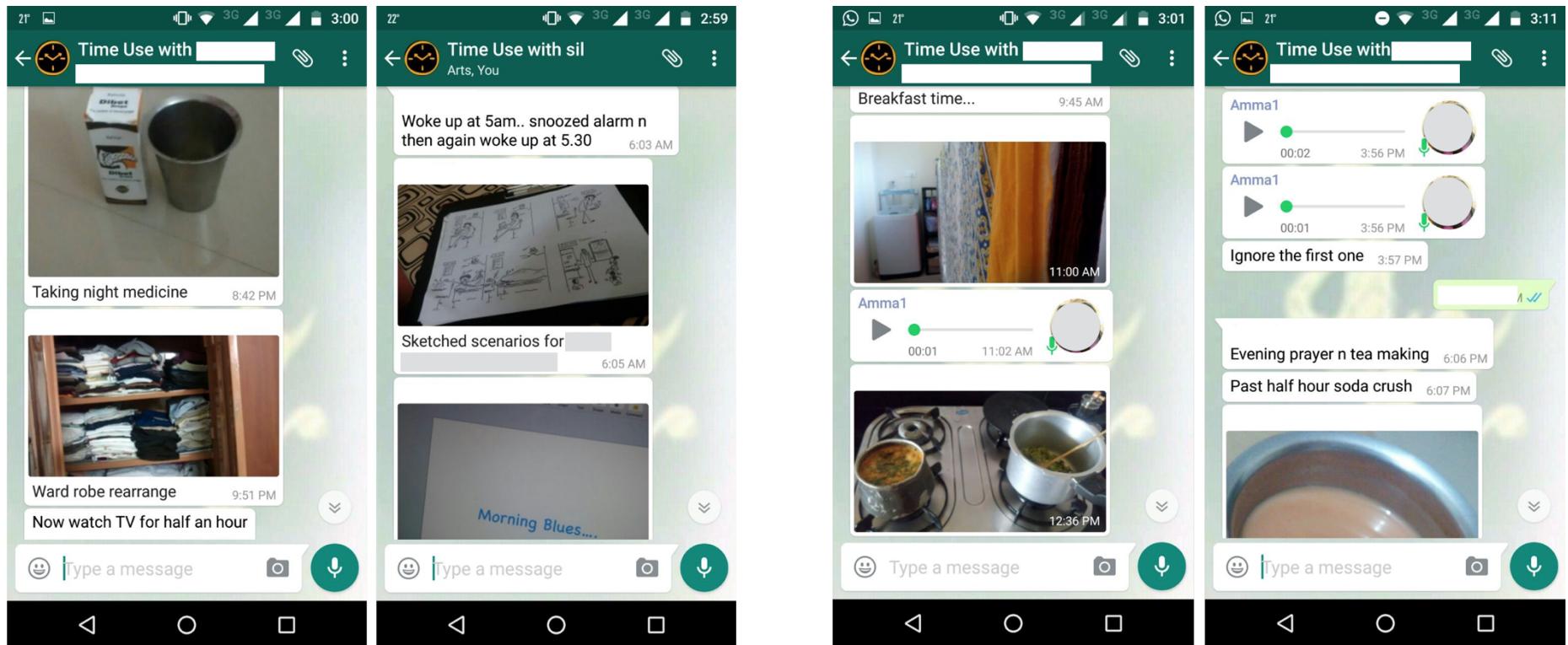
Then a broadcast group with all the participants was made which was used to send out notification and reminder at regular interval. The tone of the notification was friendly to create the impact of a conversation rather than a machine generated notification.

The reminder after every hour helped the respondents to remember to do data entry. Most respondents in about a minute or two entered data after every notification. Some reminders just said knock knock or tap tap and that was enough to remind them.

A respondent said “such notifications brought smile to my face”



Broadcast Group



Respondents used the option of clicking pictures or recording voice whenever they were busy and tagged them. The same respondent used all the three input options as when required. The photographs were used more often but when they were in social places like a shop or a restaurant respondents switched to voice messages.

8. Final Design

After feature testing, how respondents used different input methods to record time became clear. Based on the observations and findings and from the wireframes the final flow and screens for Samay Lekha were made.

The main feature is a widget that needs to be added on the home screen preferably or any other. The widget is to let the user quickly access the timer, the camera and the microphone. The list of activities are also accessible from the widget. The app itself only mainly has the timeline of the entire day.

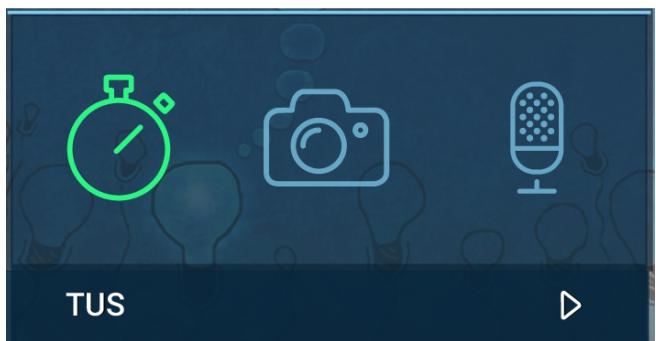
Life is short. No one wants to fill out a form. Be conversational. Be funny. Gradually engage. Do the unexpected. It is the role of the designer to express their company's brand to elicit an emotional reaction. If done correctly, it will increase completion rates. Just make sure you don't violate the rules listed above. - Data Entry by Andrew Coyle in uxdesign

The design is to make the respondent not feel the effort while entering the entire day's data. The conversational notification and ease of interactions with the app itself makes it a seamless experience. Two design explorations and the final design are explained below.

Widget

The widget requires just a single button click to start and stop a timer thus enabling respondent to record the timer and tag the activity before starting the next timer.

It comprises of icons of the timer, camera and microphone. All these three icons start the timer on clicking. The camera starts the timer but also lets respondent to click picture of the activity. The microphone along with turning turning the recorder on, allows the respondent to record anything related to the activity.



The widget is 4X2 ratio and can be resized to 4X3. The TUS here is for Time Use Study. The portion containing that when clicked takes the respondent to the application. The icons are placed in the order of frequency of usage.

There is a variation to this timer widget.



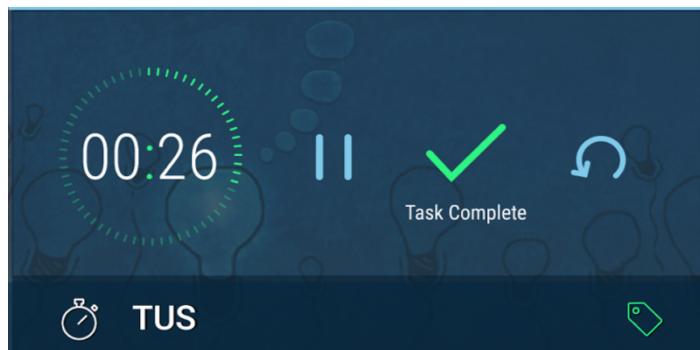
The timer icon is replaced here with a stopwatch interface. But respondents thought that they first had to start the timer and then camera to for attaching a photograph but all the three options started timer. The camera and mic were to also add markers to remind respondents later in their convenient time to recall using the reminder and update the data. This is explained in through flow of the app.

Timer

On starting an activity the respondent is required to start the timer by choosing one of the input methods. If the choice is timer, then the timer starts and is ready for tagging



Design1



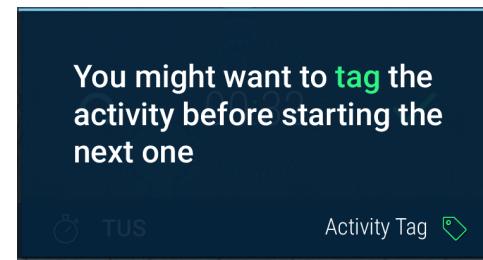
Design 2

Design 1 is used in final design since the focus in Design 2 shifts to completion of the task. In the first one the pause option is just tapping the timer once. The restart icon sets the timer to 00:00. The tick marks the end of activity.

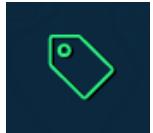
The timer icon here in the lower panel is to say the the input method is that of the timer. When the method is camera or mic it appears like this



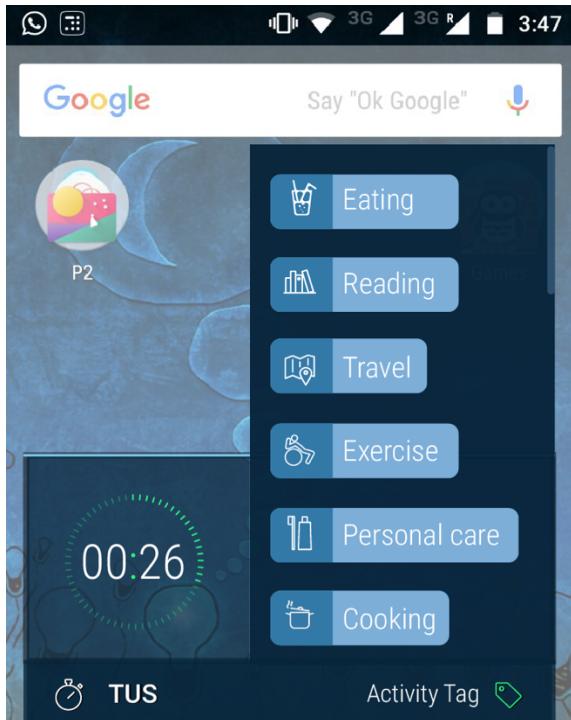
If ticked without tagging there is a glanceable warning to indicate that the activity has no tag since the respondent will not be able to place the activity related to the timer later.



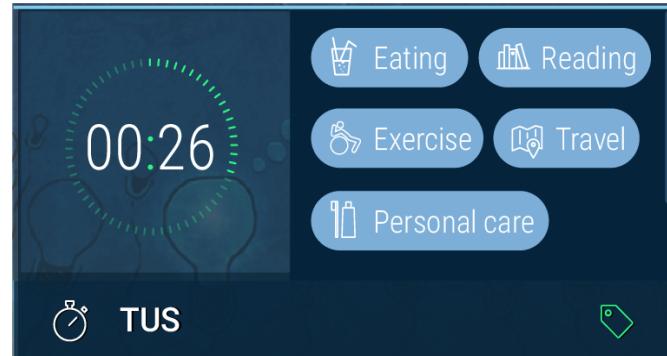
Activity Tags



On clicking tags icon from the main widget or from the warning screen gives a drop down list of activities. The activities are based on the proposed list from



Design



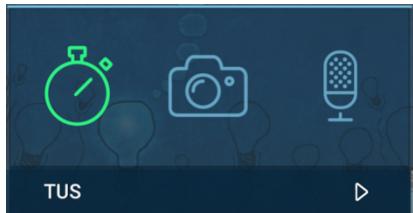
Design2

Design 2 did not work because the android list does not allow grid system. Also the widget needed more real estate for glanceability.

In design1, wherever placed the list takes 2X4 of the available screen. The list is smartly sorted based on context and the top three are based on what the participant is most likely to do at the time and location of tagging. The tagging can be done anytime while the timer is running. Once a tag is added it appears like below.



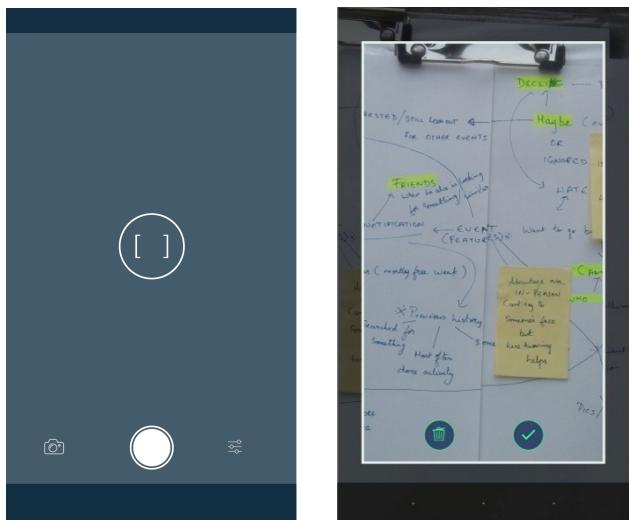
Camera and Microphone



When camera or mic icon is tapped from the widget, It takes the respondent to respective screens.

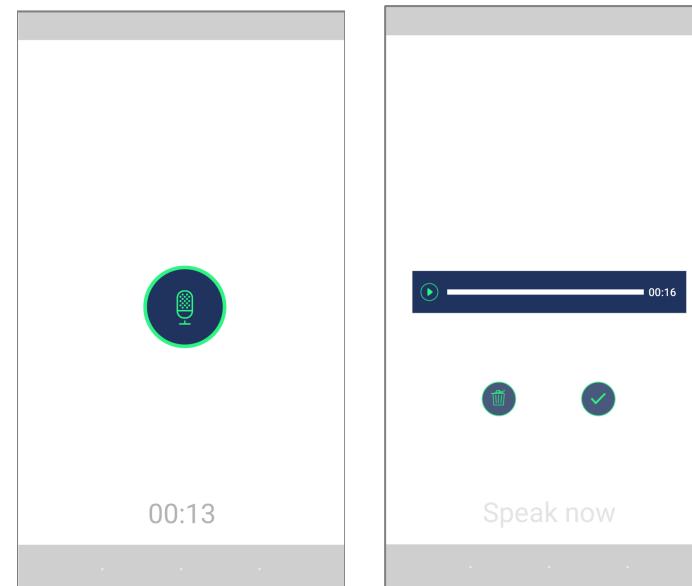
Camera

One clicking on the camera the timer automatically starts and the respondent can also click any number photos or choose from gallery.



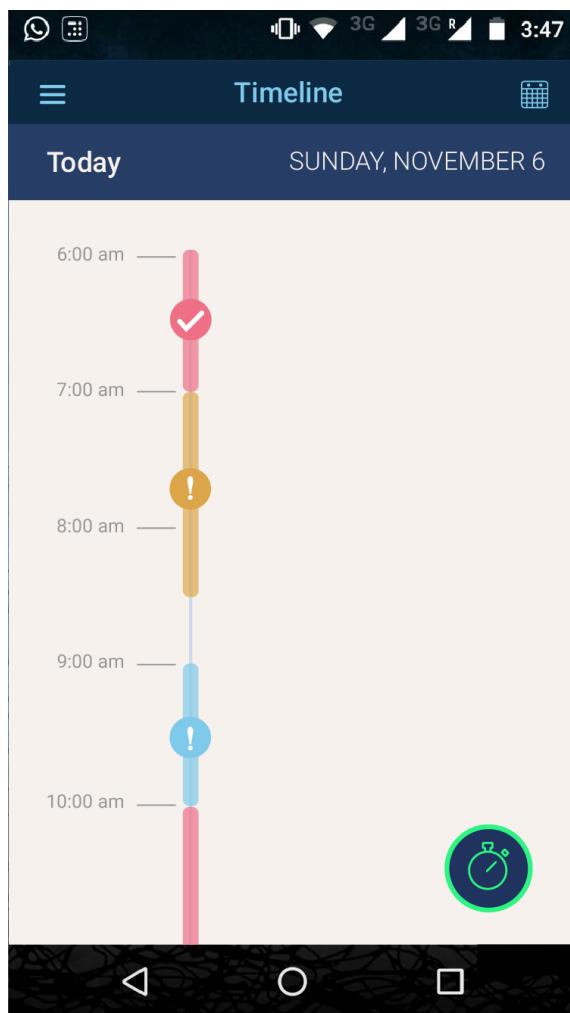
Microphone

When mic icon is tapped, the timer automatically starts and the respondent now record the activity with context or any reminder to help him or her add edit it later in the timeline.



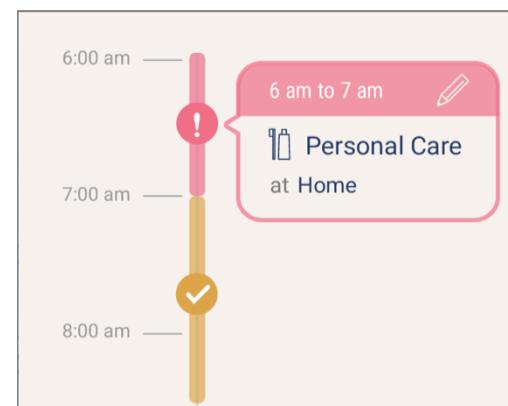
In both the cases the marker gets added in the timeline which can later be edited as per convenience.

Timeline



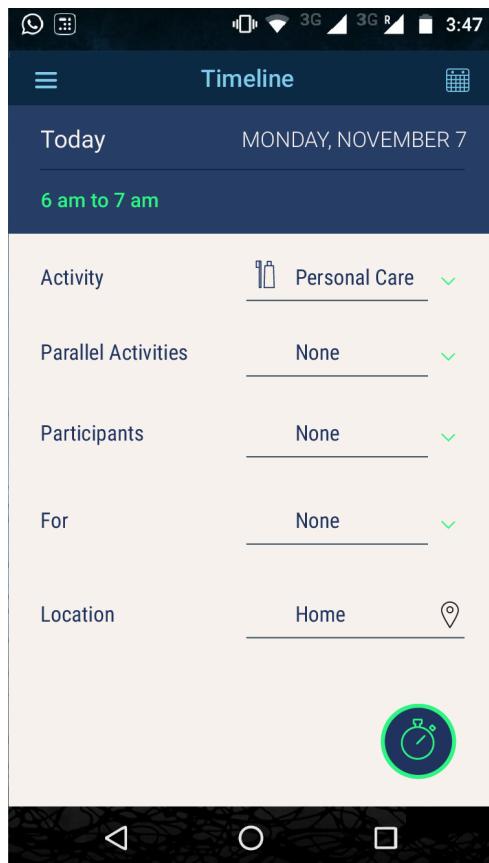
On tapping on the TUS icon from the widget or the icon from the app drawer the respondent can access the timeline. The homepage of the app is the timeline. The timeline is a 24 hours view and every activity recorded within a 24 hour span appears in a single timeline.

The time appears on the left and the activity is marked by three colours based on input method to record time. The pink is for activities recorded using a timer. The yellow is for camera and blue is for microphone



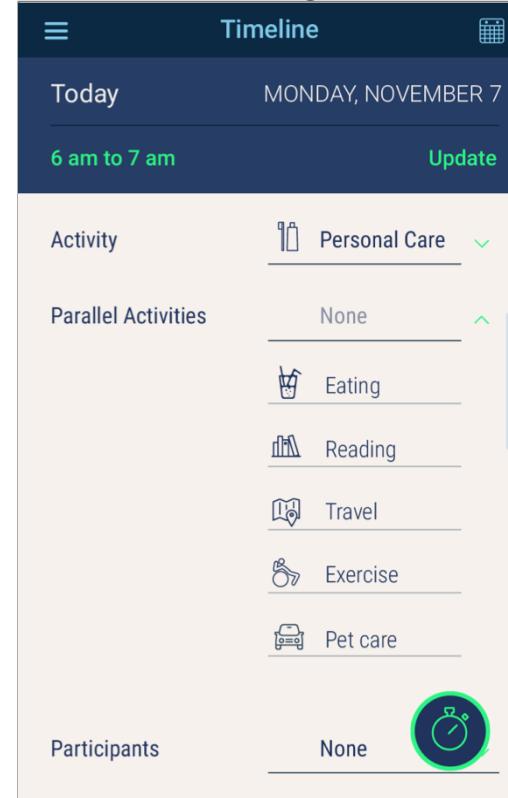
Exclamation means the activity is not completed on the timeline. Still some editing is required which means not all fields are completed but some marker is added. On tapping the Exclamation, the user gets to edit the activity to update it.

Edit Screen

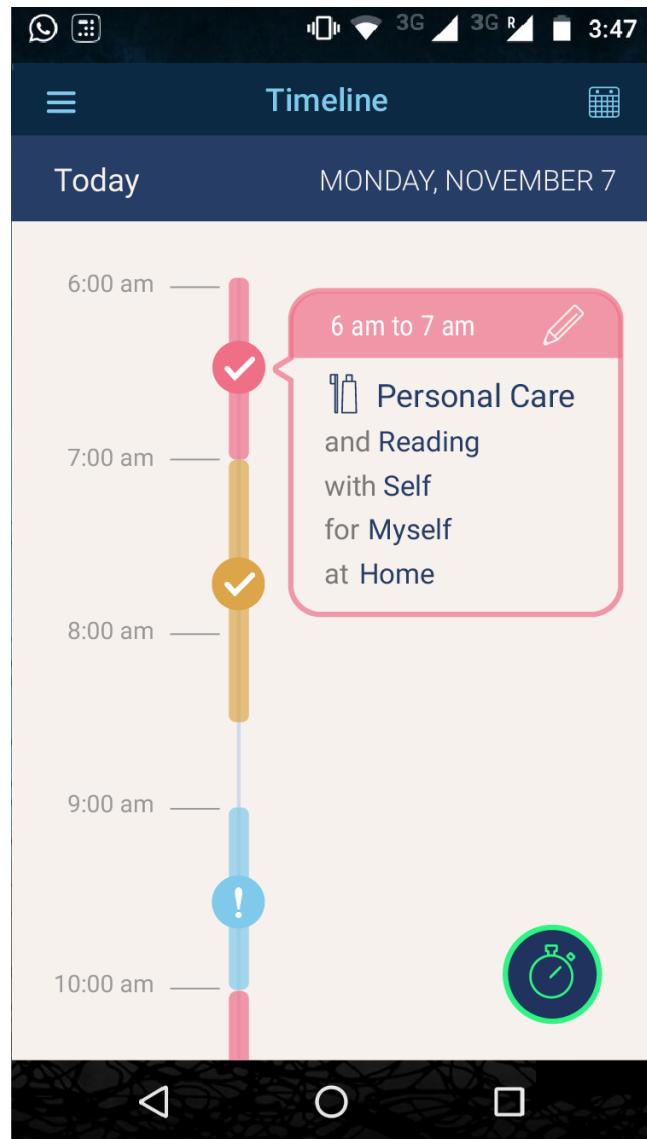


All the attributes attached to the the activity are shown here.
Respondent can clearly see which is updated and which is not.

Just choose from a dropdown list.



After filling all the fields or editing as per requirement a tap on the update button updates it on the time line



The Activity box shows attributes with conjunctions to make it like a conversation. Personal care and reading with self for myself at home. The timeline at any time does not show all the attributes or details in order for the respondent to not change behaviour.

On a single tap one opens and when another one is opened the first one closes. The calendar allows previous days viewing. The burger button contains about the research and tutorial for the application.

The timer icon in the bottom right corner of the app screen is to record time from the app or to stop a timer if already started

Data Base

The data gets saved in the database and saves the details in a simple format based on the tags. This can be easily viewed and sent to the researcher. The option to extract this is available in the burger button.



timelineDB.csv



No.	id	Start_Time	End_Time	Activity	Input_Method_Type	Latitude	Longitude	Address
1	1	2016/11/16 00:01:52	2016/11/16 00:02:00	Studying	camera			
2	2		2016/11/16 00:02:01		camera			
3	3	2016/11/16 00:02:02	2016/11/16 00:02:04		mic			
4	4	2016/11/17 04:25:56	2016/11/17 04:33:44	Studying	timer			
5	5	2016/11/17 04:33:47	2016/11/17 04:42:22		camera			
6	6	2016/11/17 04:42:26	2016/11/17 04:45:43	Work	mic			

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- [3]Ironmonger, D. (1999). An Overview of Time Use Surveys. *International Seminar on Time Use Studies* (p. 41). Ahmedabad: Ministry of statistics and programme implementation, Government of India.
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Appendix 1

TIME USE SURVEY - CLASSIFICATION USED IN THE INDIAN TIME USE SURVEY

I Primary Production Activities

11 Crop farming, kitchen gardening, etc.

 111 Ploughing, preparing land, cleaning of land

 112 Sowing, planting, transplanting

 113 Application of manure, fertilizer, pesticides and watering, preparing organic manure, harvesting, threshing, picking, winnowing

 114 Weeding

 115 Supervision of work

 116 Kitchen gardening – backyard cultivation

 117 Stocking, transporting to home, guarding or protection of crops

 118 Sale and purchase related activities

 119 Travel to the work

12 Animal Husbandry

 121 Grazing animal outside

 122 Tending animals – cleaning, washing shed, feeding, watering, preparation of feed

 123 Caring for animal : breading, shearing, medical treatment, grooming, shoeing, etc

 124 Milking and processing of milk collecting, storing of poultry products

125 Making dung cakes

126 Poultry rearing – feeding, cleaning

127 Other related activities

128 Sale and purchase related activities

129 Travel to the work

13 Fishing, Forestry, Horticulture, Gardening

 131 Nursery – seedlings

 132 Planting, tending, processing of trees

 133 Collecting, storing & stocking of fruits, etc

 134 Wood cutting, chopping & stocking firewood

 135 Fish farming, cleaning sea-bed, feeding fish catching fish, gathering other aquatic life

 136 Care of house plants, indoor and outdoor garden work

 137 Flower gardening – landscaping, maintenance, cutting, collecting, storing

 138 Sale and purchase related activities

 139 Travel to the work

14 Fetching of fruits, water, plants etc. storing and hunting

 141 Fetching of water

 142 Fetching of fruits, vegetables, berries, mushrooms etc. edible goods

 143 Fetching of minor forest produce, leaves, bamboo, etc.

 144 Fetching of fuel/fuel wood/twigs

 145 Fetching of raw material for crafts

 146 Fetching of building materials

 147 Fetching of fodder

- 148 Sale and purchase related activities
- 149 Collection of other items
- 15 Processing and Storage
 - 152 Milling, husking, pounding
 - 153 Parboiling
 - 154 Sorting, grading
 - 155 Grinding, crusting
 - 156 Any other related activities
 - 157 Sale and purchase related activities
 - 158 Travel to the work
- 16 Mining quarrying, digging, cutting, etc.
 - 161 Mining/extraction of salt
 - 162 Mining / digging / quarrying of stone, slabs, breaking of stones for construction of building road, bridges, etc.
 - 163 Digging out clay, gravel and sand
 - 164 Digging out minerals – major and minor
 - 165 Transporting in vehicles
 - 166 Storing and stocking
 - 167 Any other related activities
 - 168 Sale and purchase related activities
 - 169 Travel to the work
- II Secondary Activities**
- 21 Construction Activities
 - 211 Building & construction of dwelling (laying bricks, plastering, thatching, bamboo work, roofing) and maintenance and repairing of dwelling.
 - 212 Construction and repair of animal shed, shelter for poultry etc.
 - 213 Construction of well, storage facilities, fencing, etc. for farms, irrigation work
 - 214 Construction of public works / common infrastructure – roads, buildings, bridges, etc.
 - 217 Any other activity related
 - 218 Sale and purchase related activities
 - 219 Travel to the work
- 22 Manufacturing Activities
 - 221 Food processing and cooking for sale – making pickles, spices and other products; canning fruits, jams & jellies; banking; beverage preparation; selling readymade food, etc.
 - 222 Butchering, curing, processing, drying, storing, etc. of meat, fish, etc.
 - 223 Manufacturing of textiles – spinning, weaving, processing of textiles; knitting, sewing, garment making of cotton, wool and other materials
 - 224 Making handicrafts, pottery, printing and other crafts made primarily with hands (wood based, leather based crafts, embroidery work, etc.)
 - 225 Fitting, installing, tool setting, tool and machinery – moulding, welding, tool making
 - 226 Assembling machines, equipment and other products
 - 227 Production related work in large and small factories in different industries – as production workers, maintenance workers paid trainees and apprentices, sales administration and management activitie
 - 228 Sale and purchase activity

229 Travel for the work

III Trade, Business and Services

31 Trade and Business

- 311 Buying and selling goods – such as capital goods, intermediate goods, consumer durable, and consumer goods – in the organized and formal sectors.
- 312 Petty trading, street and door to door vending, hawking shoe cleaning, etc.
- 313 Transporting goods in trucks, tempos and motor vehicles
- 314 Transporting in hand carts, animal carts, cycle rickshaws, etc. or manually
- 315 Transport of passengers by motorized and non-motorized vehicles

32 Services

- 321 Services in government and semi-government organizations (salaried)
- 322 Services in private organizations (salaried)
- 323 Petty services: domestic servants, sweepers, washers, priest, cobbler, gardener, massaging, prostitution, (wages) watching and guarding
- 324 Professional services: medical and educational services (private tuition, non-formal teaching, etc.) financial services and management and technical consultancy services
- 325 Professional services: computer services, xerox/ photocopying services, beauty parlors, hair cutting saloons, etc.
- 326 Technical services: plumbing, electrical and electronic repair and maintenance and other related services
- 327 Others

328 Travel to work

IV Household maintenance, Management and shopping for own Household

A

- 411 Booking food items, beverages and serving
- 421 Cleaning and upkeep of dwelling and surroundings
- 422 Cleaning of utensils
- 431 Care of textiles: sorting, mending, washing, ironing and ordering clothes and linen
- 441 Shopping for goods and non-personal services; capital goods, household appliances, equipment, food and various household supplies

451 Household management: planning, supervising, paying bills, etc.

461 Do-it-yourself home improvements and maintenance, installation, servicing and repair of personal and household goods

471 Pet care

481 Travel related to household maintenance, management and shopping

491 Household maintenance, management and shopping not elsewhere classified

V Care for children, the sick, elderly and disabled for own household

B

- 511 Physical care of children: washing, dressing, feeding

521 Teaching, training and instruction of own children

531 Accompanying children to places: school, sports, lessons, etc. /PHC/doctor

541 Physical care of sick, disabled, elderly household members; washing, dressing, feeding, helping

551 Accompanying adults to receive personal care services such as hairdresser's therapy sessions, temple, religious places, etc.

561 Supervising children, needing care with or without other activity

562 Supervising adults, needing care with or without other activity

571 Travel related to care of children

572 Travel related to care of adults and others

581 Taking care of guests / visitors

591 Any other activity not mentioned above

VI Community services and Help to other Households

C

611 Community organized constructions and repairs; buildings, roads, dams, wells, ponds, etc. community assets

621 Community organized work: cooking for collective celebration, etc. 631 Volunteering with/for an organization (which does not involve working directly for individuals)

641 Volunteering work through organizations extended directly individuals and groups

651 Participation in meetings of local and informal groups / caste, tribes, professional associations, union, fraternal and political organizations

661 Involvement in civic and related responsibilities; voting, rallies, attending meetings, panchayat

671 Informal help to other households

681 Community services not elsewhere classified 691 Travel related to community services

VII Learning

D

711 General education: school / university / other educational institutions attendance

721 Studies, homework and course review related to general education

731 Additional study, non-formal education under adult education programs

741 Non-formal education for children

751 Work – related training

761 Training under government program such as TRYSEM, DWCRA and others

771 Other training / education

781 Learning not elsewhere classified 791 Travel related to learning

VIII Social and Cultural Activities, Mass Media, etc.

E

811 Participating in social events: wedding, funerals, births and other celebrations

812 Participating in religious activities: Church services, religious ceremonies, practices, kirtans, singing, etc.

813 Participating in community functions in music, dance, etc.

814 Socializing at home and outside the home

821 Arts, making music hobbies and related courses;

822 Indoor and outdoor sports participation and related courses

831 Games and other past-time activities

832 Spectator to sports, exhibitions / museums, cinemas / theater / concerts and other performances and events

841 Other related activities

851 Reading other than newspaper and magazines

852 Watching televisions and video

853 Listening to music / radio

861 Accessing information by computing

862 Visiting library

863 Reading newspaper and magazine

871 Mass media use and entertainment not classified elsewhere

891 Travel related to social, cultural and recreational activities, social cultural and recreational activities not elsewhere classified, mass media use and entertainment

IX Personal Care and Self-Maintenance

F

892 Travel related in search of job 911 Sleep and related activities

921 Eating and drinking

922 Smoking, drinking, alcohol and other intoxicants

931 Personal hygiene and health

932 Walking, exercise, running, jogging, yoga, etc

941 Receiving medical and personal care from professional

942 Receiving medical and personal care from household members

951 Talking, gossiping and quarreling

961 Doing nothing, rest and relaxation

962 Forced leisure of forced rest & relaxation-willing and available for work

971 Individual religious practices and meditation

981 Other activities

982 Resting / convalescing due to physical illness and
physical unwell persons

991 Travel related to personal care and self-maintenance