Level 1	Level 2	Level 3	India Legally Blind Group	Coding System		Summary
Interface	Category	Items	Selected Quotations	Frequency	Intensity 0 (no conflict) to 3 (extreme conflict).	User Requirements in Terms of Design preference
User Interface	Input tools (functionality, industrial and mechanical design)	Navigation tool	I am not too happy with the key protrusion What are the multifunction keys? (explain); Also it is difficult to recognize what is the down arrow and what is the up arrow	2	0	The navigation keys must be easily discernable in terms of color and tactile feedback to distinguish between all four arrow keys.
		Softkeys	Keys are lengthy; Ya it is easy and needed; Ya we know what they are but we have to remember what each button does as well coz we cant see them	3	0	The softkeys are useful but users have to memorize the function assigned to them, since the screen display cannot be read by them.
		Keypad/keyboard	This keypad is not very accessible for a visually challenged person. The first thing that should be don't is to have a dot on the 5 key;	4	0	A prominent dot on the 5 key is essential. This protrusion helps in identification of keys tactilely. With the flat key design the lateral pitch between the keys must be raised. A keypad design with a deeper key protrusion is preferred by users. A flat keypad design must be avoided Tactile feedback from the keys is an essential feature.
		Power Keys	I turned it on, but I don't know which button turned it on; No, not necessary to have separate key; Ya separate key is not needed; Ya not needed;	4 3	0 0	The 'end call key ' is used as the power key is not intuitive. A clear symbol must indicate the power function on the end key. The phone was turned on mainly by trial and error. Separate power key is not needed. Identification of keys is simplified after training and practice on the cell phone
		Shortcut Keys	Are very important; Even for network selection we use shortcut keys;	2	0	

				3	0	For frequently used numbers speed dial keys more frequently as opposed to the phonebook dialing.
		Call Management	Also the incoming call volume must be quite high, coz we have so much noise in the trains and all;			
			A speaker phone is a must too;	2	0	Registered calls (Last dialed, Missed, Received) are more frequently used as compared to looking up the phone book. Call volume must be easily adjusted to adapt to noisy environments such as local trains
		Call Feedback	One thing that happens is that, after you talk to someone u press the end key and then you feel that ya, Now the call is over. But it's not and I have had experience in someone getting over billed because of that;	1	0	Audio or tactile feedback for call end is required to ensure that the call is over.
			The feedback should be prompt and more immediate than what it currently is;	3	0	
		Voice keys Indicators Language	It should say something whenever we press any key; Mod: Ok so what about beeps? Ya that helps but voice is preferable;			Prefer voice feedback as compared to audio feedback as beeps. Users would like to use the feature of voice dialing however they do not trust the reliability of its accuracy.
	Display	Font/ screen	Does the phone have the option of increasing the font size?	2	0	The size of the phone is too large and bulky. It is inconvenient to carry a large and bulky phone in crowded places such as local trains.
			Actually when it comes to a totally blind person he/she does not need the screen, so you could reduce the size of the phone.	2	2	Users would like to have the option of increasing the font size on the screen.
		Localization	Also the incoming call volume must be quite high, coz we have so much noise in the trains and all;	3	0	Users with residual vision need larger screens on cell phones, however some partially sighted individuals who cannot see the screen would like to have a phone without a screen to reduce the size of the phone.
	Audio, Voices	Ringing tones	In my phone if I press Ok 51, it takes me directly to profiles where I can change whatever I like;	1	0	Users require training or manuals before using a feature in a new phone.
			Is ringtone in media player? Or ringtones	2	0	Users currently use shortcut keys to change ringtones in profiles. Users prefer to use the feature of changing the ringtone often.
			Does this have a composer I would like to compose ringtones	2	0	Users assign ringtones to frequently used numbers often and they require a feature that would allow them to easily use this feature.
			So instead of camera if that function can be included it will be better for us; I like changing my ringtones frequently	2	2	

	Weight	Phone is too heavy	6	0	Users prefer lighter phones
	Slide/flap	The flap is good. To protect the keys and prevent key unintentional key presses	5	0	The users prefer the flip mechanism of the cell phone to ensure that the keys are well protected from unintentional key presses.
Ergonomics	Size	In India it is difficult for us to carry such large phones, especially due to the crowded trains and all;	3	0	Users did not like the large size of the text phone model. They would prefer a phone size that fits easily in their pocket.
		It is tooo bulky;	3	0	Large phone sizes are cumbersome for users to carry in crowded environments such as local trains.
		It should be small-sized so one can carry easily in their pocket;	1	0	Users do not want to compromise on the phone size, but also require a large screen size.
		Only ladies carry in their bag, but for men it is important that it easily fits in their pocket. For us it should be smaller than this;	2	0	
		So size of the device is not an issue, a screen reader is a must;			User requirements on screen size varied with the degree of visual impairment. Users with minimal residual vision gave high importance to screen reading software as compared to the size of the screen.
Detachable parts	SIM card	It is not easy removing and adding sim cards; Both these things are not user friendly not blind friendly;	3	0	Users require easy to use method of changing sim cards on cell phones
	Battery	The way to take out a battery is not very easy; If they want to learn how to remove batteries, they should learn from transistor manufacturers;	2	0	Users require an accessible method of remove the cell phone battery.
Communication method	Radio Link	The radio feature is an added useful feature	2	0	
	Bluetooth	No we don't use it; If it is available it will be useful to use the internet and all;	3	0	Users are aware of the Bluetooth technology and would like to use this feature if it were accessible.

	Applications	Fun	I like composing ringtones for fun and to keep upto date with the latest ringtones	2	0	Users use features such as Radio and Composing RIngtones
		Usability	We don't know how to use this phone that is why it is complicated. If we get habituated then there will be no problem at all;	2	1	Users state that they are unable to perform the tasks on the cell phone due to lack of training and lack of familiarity. Users did not state many usability problems with the interface.
			I am not changing my phone model because new models are too diffcult to learn only, coz who will show me how to operate this;	3	1	Users have issues with the learnability of new cell phones and hence avoid purchasing newer models.
			Ya that is why I said there should be a Braille manual or a talking software with that;			
External Interface	User Support	Local help	Ok so when you got your phone how did you figure out how to learn to use it?			Users depend on friends and family to train them to use the cell phone advanced features.
			Dialing numbers and all we could easily make out;			
			For other functions we referred to the manual and our friends also. Those who were using same handset;			
			Friends and family;			
			Ya;			
			On our own we cannot get enough information of how to use the phone. So we had to depend on friends and family for this;			
		Manuals	The manual should be printed in Braille also. I think in the States; they maybe getting this. But here in India we don't;	4	0	Users would like to refer to instruction manuals, however are unable to do so due to unavailability of accessible formats.
			In States you get everything in Braille, even the hotel menus are available in Braille. We are in India, that is very difficult for us;			Users would like have option of all different formats of accessible formats including Large print hard copies, Audio based, web-based, braille and electronic.
			Ya that is why I said na there should be a Braille manual or a talking software with that;			Users prefer a phone that is intuitive enough so that there is no need for a manual.
			Ok so when you got your phone how did you figure out how to learn to use it?			
			Dialing numbers and all we could easily make out.			
			For other functions we referred to the manual and our friends also. Those who were using same handset;			
			Ya voice is good;			
			We would like all of these formats;			

			Ya so there should be option for everyone;	5	0	
	Accessories	Charger	Another thing is that I find it difficult where to put the charger;	2	0	
	Supporting software	PC software				
		Downloadable	Would like a screen reader and magnifier like the one on the computer (ZOOMtext , magic)	1	0	Users have repeatedly mentioned the need for accessible magnification and screen reading software for the cell phones.
		applications	Any mobile that is sold, there should be standardization. They have to have a ..those who need the speech output, it is not only blind people who may need it. Senior citizens may also need it? The company or the cell phone provider must provide it. And that must be at an in-built cost. It should not depend on the cost of the mobile. It should be in-built.	1	0	
Service Interface	Services	Availability	Besides the handset there are some things that must be taken care of by the mobile service providers. The providers are responsible for connectivity right? So they should also take care of certain things. The mobile assist executives have all the information required by the users. They provide us with the handsets but they don't have enough information about the handsets. When they don't know something, they direct us to the website or to go to the mobile manufacturers' gallery. We can't go to the gallery all the time. There should be someone above them to attend to us, if a customer service executive is unable to attend to us; I agree	1	0	Users with disabilities express the lack of customer service through phone calls, emails etc. The users express the need for customer support to solve their problems with service issues and cell phone compatibility issues.
		Utility	In India we still do face a lot of network problems, so it is important for a mobile phone manufacturer to be compatible with a service provider that has good network coverage			
Software	Task: Placing a Call		Typically we use speed dialing; If the numbers are not regular numbers then we are used to dialing the entire number. So with those we are regular, we use the speed dialing option; Searching in the phonebook is very complicated; Ya if the screen reader is available then we can do it easily; Generally we do remember the numbers and then dial; I do generally use the phonebook, but when I am out in the sunlight I cannot actually see anything. When I am inside I look at the phone book;			Looking up the phonebook to dial is difficult therefore users do not use this function often. They prefer to dial numbers that they have memorized as opposed to looking up the phone book. Prefer shortcut keys as compared to looking up the phonebook.
	Task:		Ok so how do you find this task?			

	Changing Ringtone		It is easy on my phone;			
			Mod: Ok so what about this phone?			
			I would need tuition of 1 hour for this;			
			All (laughing);			
			Just give us 1 day's time and then we will know how to do it;			
			Don't give us manual. Just give us some time with the hand set for 1 day and we will figure it out;			
			It was too difficult and confusing;			
			Ya;			
			Mod: Ok so how would you make this task easier to use?	2	0	
			With the help of others. And with the help of additional reading software;			
			If you would have told us how to do this, we would have figured it out. Otherwise we can't use;			
			Ok so what all assistance does this phone provide?			
			If you are really using this phone, what kind of instruments you are using? And what kind of work you are working with? (What's your profession). So that makes the sales;			
			Mod: So this is important?			
			All: Yes, yes, most important;			
			Ya it is important but if you are not able to store then you will have to remember the numbers and dial them;	4	0	
	Task: Storing number		Sighted people usually see the name and store it. It is difficult for us to see. So if the phone could speak aloud the number and how to store it, it would be useful to us.			

			In the first task I had entered this by mistake, so I could go halfway; Ya I got it now. I spoke to u about reading the name right? I would precisely like a screen reader, which would read aloud everything on the screen; Ya when I was entering the number I made a mistake. And then I tried to clear it and everything had gone by then and the second time I tried I could not find it; Now some complications are coming. We don't know about it yet, we don't know this instrument that is why this is happening; For me if you provide emails on the cell phone only then will hearing (read aloud) be important. For all other functions I can manage with shortcut keys; If you talk about SMS at this point I am not really concerned I don't really care. I have told all my friends don't send me SMSs and all. So all the SMSs I get are from the company….like thank u for your payment; If the screen reader tells us everything then we will be able to operate this very easily. Also if it tells us what button to press when, we will be able to operate this very easily;			Users expressed the need for a screen reading software called 'talks' to be installed to complete the task of sending an SMS. Users found too many options at each stage of the menu confusing. A fewer number of options at each stage would make this task more intuitive. The task was unsuccessful since the interface was unfamiliar. Therefore they feel they would be more successful if the interface was similar to their current cell phone. Users state that for some features such as SMS it is either the use of screen reader/talking software or asking others to help Voice feedback to indicate task completion is needed in current phones
	Task: Send SMS					
Profiles			So when we go to the menu it should say, shortcut key for profiles is so and so. So once we know the shortcut keys we will be able to use this much more efficiently; I am aware of the concept of profiles. Use it very often	3 7	0 0	
Important Functions			Yes it is very important and other things like an organizer and scheduler is also important; At least a mobile phone is with you all the time. So when there is an emergency such as fire, if you go hunting for your landline you may just get burnt down. So at least the mobile phone is next to you and u can immediately call for help;	2 2	0 0	Organizer, scheduler, Calendar, SMS, Volume Control, Ringtones
Advanced Functions			Mod; Ok so would you like a phone with limited features or many features? All: A lot of different functions; As long as they are accessible; We actually rather have a phone that has limited but accessible functions rather	3 6 4	2 2 0	

			than many functions that I cannot use; I feel a phone should be just like a computer; Image Recognition: Not used as a barcode reader but a money recognizer and color recognizer. about TV calls?: again these are dreams when will they be a reality?		
Accessible Phone: SUmmary			Accessible: Hardware and software both should be so comfortable that we can use it without assistance; Without any limitations, frustration, confusion; Like how we use a computer with the help of Jaws; It should be affordable		
Ideal Phone			A phone with a talking software and advanced features.		Screen reader and Talking software is an important feature in an Ideal cell phone