Digital Access and Use Index

The Digital Access and Use Index (DAUI) is a composite metric designed to capture how well individuals in low resource settings can access and use mobile-phone and internet technologies. The DAUI seeks to expand the measurement of the digital gender gap beyond device ownership to consider quality of access, digital skills, digital agency, safety and security, and the real-life relevance of digital activities. The accompanying survey questions proposed to measure the Index have been developed following cognitive testing in India, Kenya and Nigeria. The listing below represents a sub-set of a broader bank of digital access and use questions available for use (Annex 1).

Components of Digital Access and Use

Table 1. Components of digital access and use

Access	Connectivity	• Network access, quality • SIM cards	• Electricity
	Physical access	• Ownership • Sharing • Phone type	• Phone Condition • Time, duration, periodicity of access
	Affordability	Device and connectivity expenditure	
Use	Digital competency	• Information and data liter • Communication and collaboration • Digital content creation • Safety	• Problem solving • Device, software operation • Digital financial, economic skills
	Safety and security	• Digital violence • Mis/Dis/Mal-information • Privacy and Data protectio	• Digital fraud • Health implications • Biases in AI & algorithms
	Social norms, attitudes	Social norms and attitudes towards phone, internet use, use of phones for financial transactions	
	Digital agency	• Decision-making • Permissions	• Restrictions / constraints
	Relevance	• Education • Health	• Agriculture • Economic empowerment

Each domain in the Digital Access and Use Index captures a distinct aspect of how individuals interact with mobile and internet technologies. These domains ranging from physical access and digital skills to safety, autonomy, and use-case relevance of digital activities are designed to reflect how meaningfully they use the devices or internet. A sub-set of priority items within the domains listed in Table 1 have been used to derive the Digital Access and Use Index. By drawing from items across these domains, the Index allows for targeted insights into which barriers different populations face and where interventions may be most needed.

Scoring Approach

1. Empirical reduction: Structural Equation Modelling (SEM) and Principal Component Analysis (PCA) were applied to the original item pool to identify latent dimensions, drop weak items (e.g., "Attitudes", network-strength, electricity), and confirm the five-domain structure. These methods allowed us to narrow the universe of items to the current set used for the index.

However, the data used for the empirical measure is only relevant to an extremely niche and homogenous population which might not be representative globally. The decisions to include or exclude certain items cannot be entirely based on data. Theoretical and logical considerations are required. Item weighting cannot be accomplished by a data driven approach for this Index. Methods of measurement play a significant role in the value contributed to the index. This is why we require an expert consensus.

2. Expert consensus: A survey was sent out to sector specialists prior to an in-person workshop where importance and feasibility of measuring each item was reported on. Discussants scored each item in the full inventory as well as ranked the importance of digital skills. Together these items were compared against the original inventory and a revised set of items are proposed.

Summary of original scores assigned to components

Table 2. Minimum set of questions used in the digital access and use index

Digital Access and Use Score - Subcomponents		Max score	%	#Q	%
Digital Competency	Digital skills	14	50%	19	68%
Physical Access	Ownership x Phone type	6	21%	4	14%
	Condition of phone	2	7%	1	4%
	Access during the day	3	11%	1	4%
Safety and Security	Lock on phone (device)	1	4%	1	4%
	Lock on banking app	1	4%	1	4%
Digital Agency	Decision making over phone use	1	4%	1	4%
Total		28	100%	28	100%

Two domains drive the Digital Access and Use Score: Digital competence and Physical Access. The Index itself is generated by splitting a continuous score into four levels: No Access (0), Low (1 - 10), Medium (11 - 20), High (21 - 28).

Index uses

1. Conceptualized as a continuous variable:

The DAU Index can be visualized as a continuous variable to identify trends in the digital access and use in various populations as well identify differences in various groups. Fig 1a. Shows the distribution in a tested sample population between men and women which showed how the DAU index can highlight a significant gender gap in the sample population. Fig 1b. further shows the trends by various socioeconomic factors.

Figure 1a. DAU Scores distribution in a tested sample population

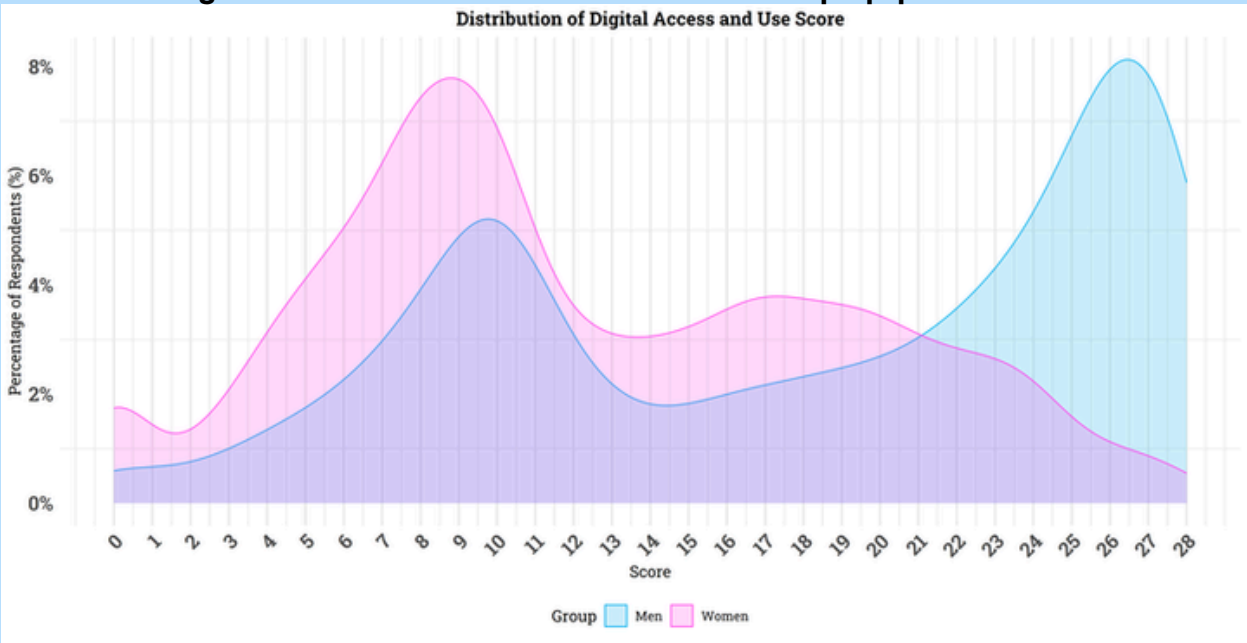
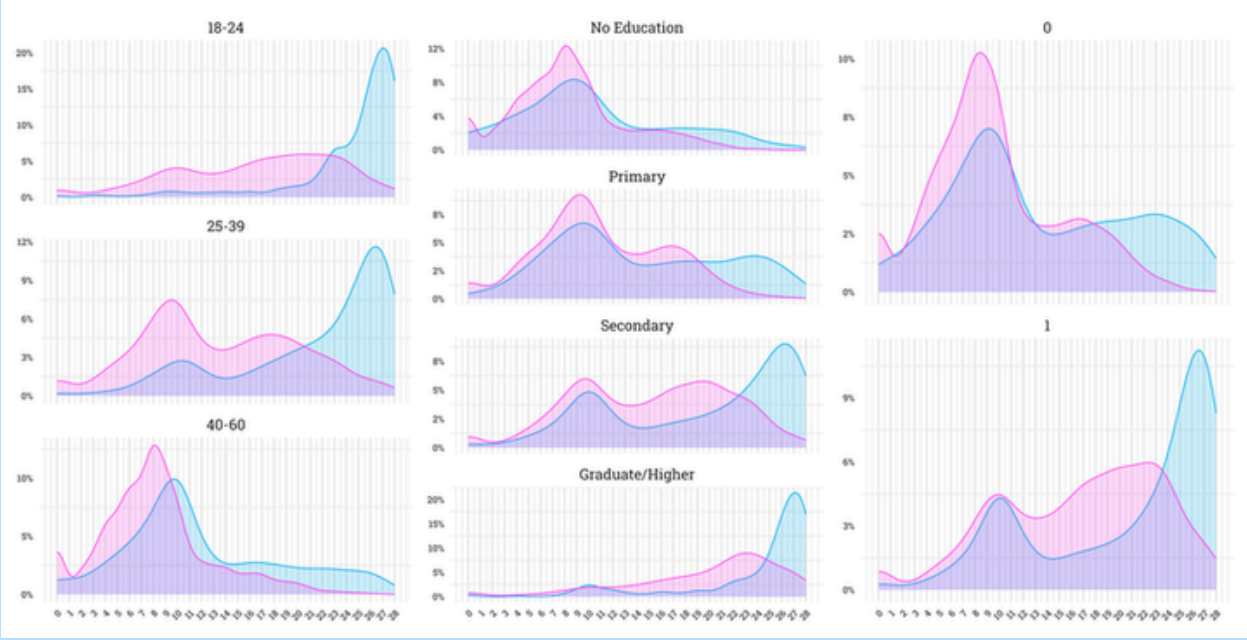


Figure 1b. DAU Scores distribution in a tested sample population (Age, Education, Literacy)



Index uses

2. Break out the "Digital Access" from the "Digital Use" → helps to showcase that removing physical access barriers alone is insufficient:

Further, we can disaggregate the Access components from the Use components of the index to differentially assess trends. Figures 2a and 2b show a shortened scale of the index with only three Use components. An example of programmatic significance of the index comes in fig 2b where we look at the use scores for a population with Smartphone ownership and still note a significant gender gap in use. This indicates that even in people who own smartphones, which is theoretically the highest level of digital access, a gender gap in skills persists which is not explained by the underlying differences in access.

Figure 2a. DAU Scores distribution in a tested sample population

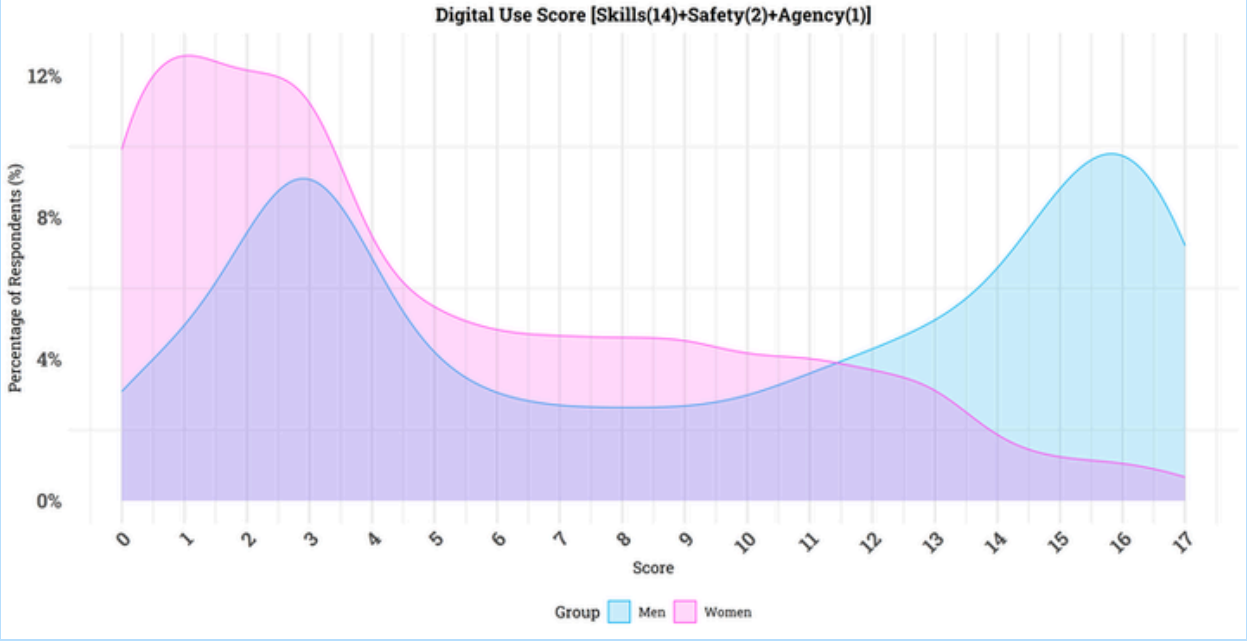
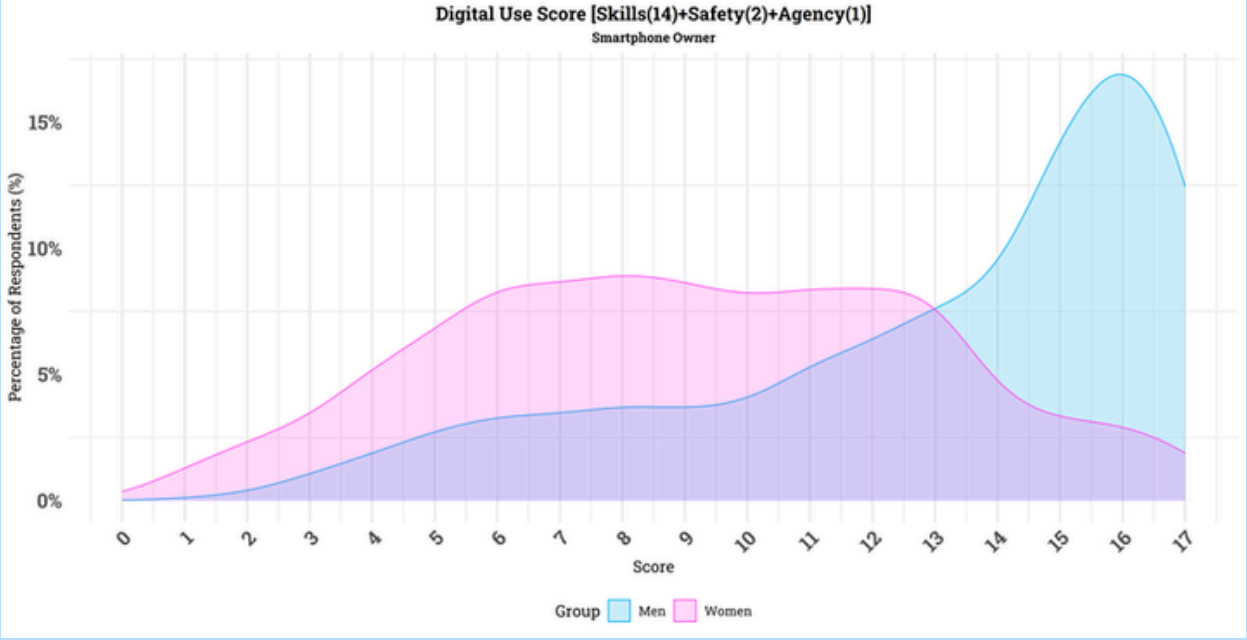


Figure 2b. DAU Scores distribution in a tested sample population



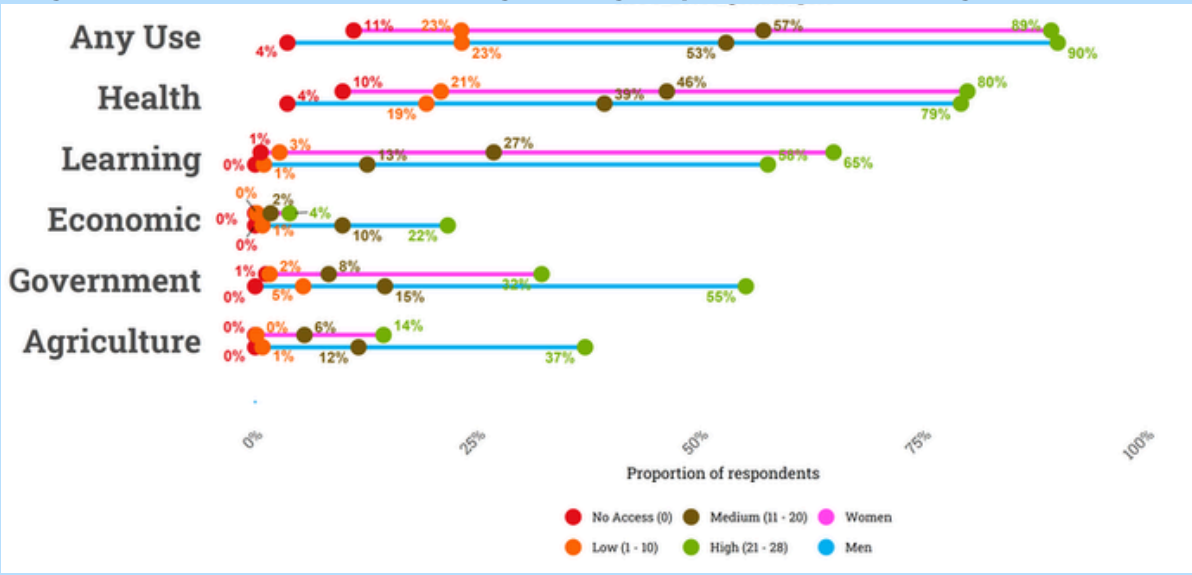
Index uses

3. Monitoring, learning and evaluation → evidence generation:
The DAUI provides a structured and standardized way to assess how different populations interact with digital technologies. By disaggregating data by SES factors, the index can help evaluate the effectiveness of digital inclusion interventions.

4. Comparisons over time, across geographies, and by gender:
A core strength of the DAUI is its ability to make comparative assessments. The index can be used to track progress in digital access and use within a community or region over time, benchmark performance between groups, and identify pockets of digital exclusion that require focused interventions. This temporal comparability can enable policymakers and researchers to understand which populations are being left behind and tailor strategies accordingly.

5. Inform program design, resource allocation, advocacy:
Insights from the DAUI can guide the development and refinement of digital programs. Programs can be designed to target populations with low competency scores despite high access levels. Resources can be allocated to the most critical barriers, whether it's affordability, agency, or digital skills. By pinpointing exactly where gaps lie, the Index aims to inform evidence-based decision-making and facilitate more equitable digital development.

Figure 2c. DAU Scores distribution against High Impact Use Cases among men and women



Revised Index following expert consultation

Figure 1c. Expert opinion on importance and feasibility of items

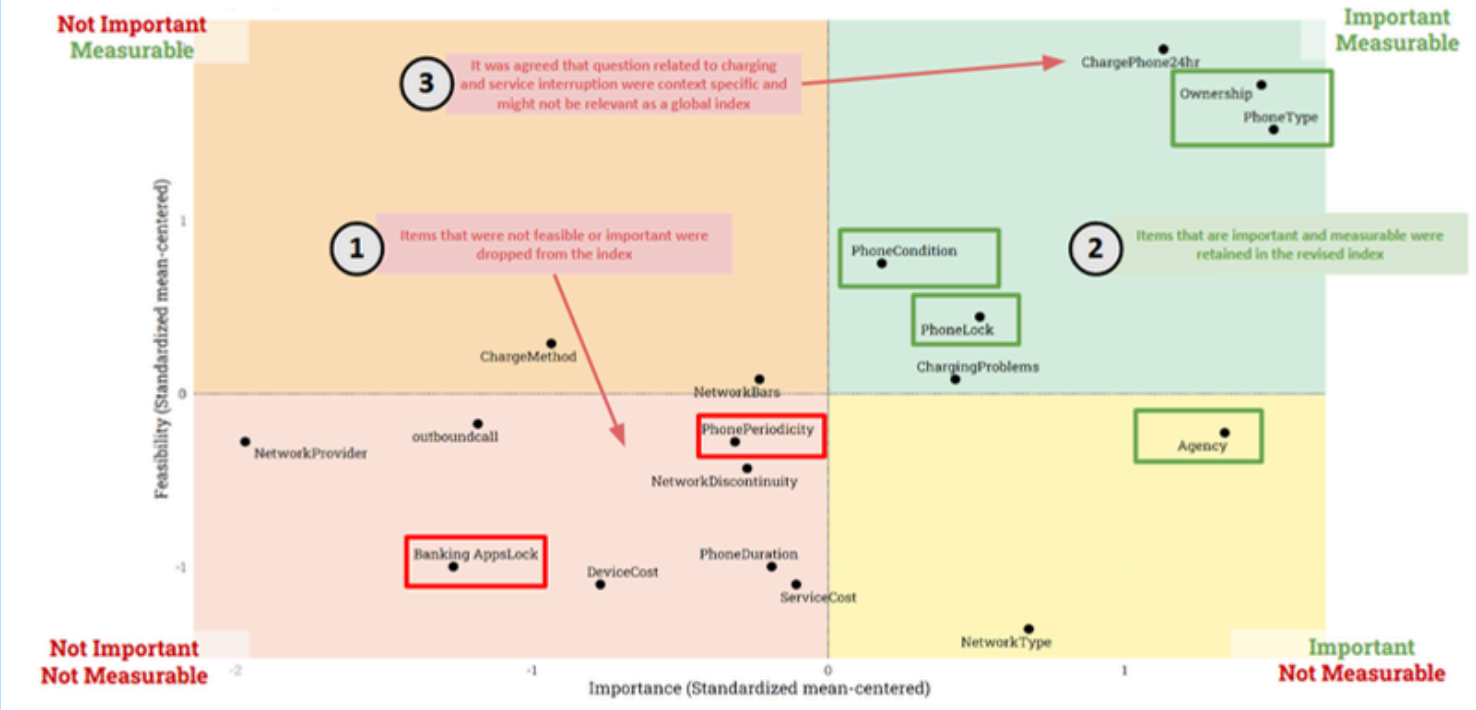


Table 2. Revised inventory of Digital Access and Use Index

Digital Access and Use Score - Subcomponents		Max score	%	#Q	%
Digital Competency	Digital skills	6	38%	6	46%
Physical Access	Ownership x Phone type	6	38%	4	31%
	Condition of phone	2	13%	1	8%
Safety and Security	Lock on phone (device)	1	6%	1	8%
Digital Agency	Decision making over phone use	1	6%	1	8%
		16	**100%**	**13**	**100%**

Minimum set of Digital Access and Use Items

Table 2. Minimum set of questions used in the digital access and use index

Physical Access Score				
Access score = (A*B) + C + D		**Questions to measure item**	**Response Options**	**Item Scoring criteria**
A. Ownership Score	101	Have you ever used a mobile phone?	1-Yes, 2-No	0 - No access
	102	Do you have your own mobile phone?	1-Yes, 2-No	1 - Sharer
	103	Is there a mobile phone that you use?	1-Yes, 2-No	2 - Owner
B. Phone Type	104	What type of mobile phone do you have?	1-Basic phone 2-Feature phone 3-Smart phone	0 - No Access 1 - Basic Phone 2 - Feature Phone 3 - Smart Phone
C. All components of the phone working	For the phone, please assess the following components:			
	105	Can the mobile phone remain on without being connected to the charger?	1-Yes, 2-No	0 - No Access
	106	Screen cracked so severely content cannot be read	1-Yes, Screen Cracked 2- No, Screen Intact	1 - Some components not working
	107	Touch screen works and/or all keys work	1-Yes, 2-No	2- All components working
D. Access during morning, afternoon or whole day	108	When was the mobile phone within your reach yesterday? In the morning, in the afternoon, in the evening, or in the night?	1-Whole day 2-Morning (6am - 12pm) 3-Afternoon (12pm - 6pm) 4-Evening (6pm - 10pm) 5-Night (10pm - 6 am)	0 - No Access or Not at all 1 - Night/ Evening Only 2 - Morning/Afternoon Only 3 - Whole Day
Safety and Security Score				
Lock on Phone (1) + Lock on Banking App (1)		**Questions to measure item**	**Response Options**	**Item Scoring criteria**
Have lock on phone	201	Is there a lock, pin, or passcode on the mobile phone you use?	1-Yes, 2-No 98-Don't know	1 - Yes
Have lock on Banking App	202	Is there a lock on any of the applications you use? - Banking apps	1-Yes, 2-No 3-I don't use this	1 - Yes
Digital Agency Score				
Agency Score (1)		**Questions to measure item**	**Response Options**	**Item Scoring criteria**
Decision-making on phone use	301	Who makes decisions about who can use the phone and when they can use it?	Self/Spouse or Fiancé/ Father/Mother/ Brother/ Sister/ Son/ Daughter/ Mother-in-law/Father-in-law/Other male relative/ Other female relative/ Friend/Respondent and Spouse/Respondent and other person/Other (Specify)	Agency Score = 1 if respondent solely makes decisions about who can use the phone and when

Items marked in **grey** were excluded after expert consultation

Digital Competency Score				
Competency Score = x/14 skills reported		**Questions to measure item**	**Response Options**	**Item Scoring criteria**
Sent SMS or WhatsApp	401	Have you ever typed and sent a message on WhatsApp, Facebook messenger or other chat apps?	1-Yes, 2-No	1 - Yes, to either
	402	Have you ever written and sent an SMS text message?	1-Yes, 2-No	
Navigated auto prompts (IVR)	403	Which key you would press if you want to talk to a doctor? (After playing an audio sample of an IVR)	1-Completed the task 2-Did not complete the task	1 - Completed the task
Made a phone or WhatsApp call	404	Have you ever made a phone call by dialing a number?	1-Yes, 2-No	1 - Yes, to either
	405	Have you ever made a call on WhatsApp, Facebook Messenger or any other such apps?	1-Yes, 2-No	
Shared media via app	406	Have you ever shared a document, picture, or video through a message on WhatsApp, Facebook Messenger or other such apps?	1-Yes, 2-No	1 - Yes
Took a photo or video	407	Have you ever taken a photo with a mobile phone?	1-Yes, 2-No	1 - Yes, to either
	408	Have you ever taken a video with a mobile phone?	1-Yes, 2-No	
Ever Used Social Media	409	Have you ever used Facebook, Instagram, Moj, or any similar social media app on a mobile phone?	1-Yes, 2-No	1 - Yes
Made a post or story on social media	410	Have you ever made a reel, story, or short on YouTube, Facebook, Instagram, etc.?	1-Yes, 2-No	1 - Yes
Downloaded an app	411	Have you ever downloaded an app on a mobile phone?	1-Yes, 2-No	1 - Yes
Created a hotspot	412	Have you ever created a hotspot using a mobile phone?	1-Yes, 2-No	1 - Yes
Searched the internet (Google)	413	Have you ever searched for information on the internet (e.g. Google, YouTube)?	1-Yes, 2-No	1 - Yes
Scanned a QR code	414	Have you ever used a mobile phone to scan a QR code?	1-Yes, 2-No	1 - Yes, to either
	415	Have you ever used a mobile phone to scan a QR code and buy something?	1-Yes, 2-No	
Used G Pay/Paytm (send/receive money)	416	Have you ever used Google Pay/G pay, PhonePe, Paytm or similar apps to receive money?	1-Yes, 2-No	1 - Yes, to either
	417	Have you ever used Google Pay/G pay, PhonePe, Paytm or similar apps to send money?	1-Yes, 2-No	
Used mobile banking	418	Can you access your bank account using your mobile phone?	1-Yes, 2-No	1 - Yes
Blocked a number	419	Have you ever blocked a number on a mobile phone?	1-Yes, 2-No	1 - Yes

Items marked in **grey** were excluded after expert consultation

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