



# DIGITAL ACCESS AND BEYOND

How being online is impacting the lives of  
India's Next Half Billion users





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# SNAPSHOT OF DIGITAL ACCESS AND BEYOND:

## How being online is impacting the lives of India's Next Half Billion users

India's Next Half Billion (NHB) are the second big wave of internet users, primarily from lower-income households. They started to come online in 2017.



### What have we got right so far: The tracks for digital are laid and working

Driven by improvements in connectivity, the expansion of enabling infrastructure like UPI, and investments in innovation and entrepreneurship, hundreds of millions of Indians from lower-income households are now online and leading active digital lives.

- **9 out of 10 lower-income Indian households—including in rural India—are now online.** Across these households, 350 million adults (representing 60% of all lower-income adults) are online as of 2023.
- **1 in 2 of the NHB use advanced digital services**, such as digital payments, creating content, e-commerce, and digital tools for work. Almost all (96%) of the NHB use basic services, such as communication and content consumption.

Being online is helping many of the NHB improve specific aspects of their lives, and a minority of them experience life-changing gains.

- **Over 40% of the NHB say that being online has increased their standard of living.** 38% say that being online has provided them more ways to earn a living, and another 35% say that being online has increased their agency over financial matters.
- **1 in 7 NHB say that being online has had a positive impact** across nearly all the dimensions studied in the report: from exposure, self-confidence, and agency to improved standard of living, to community engagement. A further quarter reports a net positive impact. Among the big winners are many NHB entrepreneurs.



### The digital ecosystem now needs to prioritize addressing the human and social challenges that remain so that all Indians can benefit from being online.

- **225 million Indians are not yet online, including many women and most of the elderly.** Half of all low-income women and two-thirds of those above the age of 40 remain digitally dark.
- **Nearly half of those who are online (members of the NHB) say that their lives have not been meaningfully impacted by going online.** This includes a mix of those who report no change across multiple dimensions (38%) and those who experienced a mix of benefits and harms (7%).

Some of the NHB, meanwhile, say that the net impact of digital on their lives has been negative. Half of the NHB report facing online harms.

- **1 in 10 NHB say that going online has made them worse off.**
- **1 in 2 NHB have experienced fraud, online abuse and/or psychological harm online in the last year.** A quarter have experienced all of these harms. 1 in 4 opt out of digital services because they worry about harms.
- Transgender members of the NHB face harms 40% more frequently than do others.

The gender gap remains a major concern: women are less likely to be online, less likely to be power users and less likely to report that digital is having a positive impact on their lives than men.

- **50% more men than women are online.** While the relative gap has decreased, the absolute gap between the number of men and women online has grown from 46.5 million to 78.5 million since 2017.
- Among those online, 60% of men are power users or pathfinders as opposed to 51% of women—and men are 30% more likely to report that digital has had a transformative positive impact. These gaps persist even among young people.
- Only 1 in 2 businesses surveyed say they consider serving women a top current or future priority.



### 4 key areas of focus moving forward

There is a clear appetite for greater digital engagement.

- **1 in 3 of the NHB would like to engage in additional online activities**, but they face barriers such as low relevance, difficulty of use, and lack of trust or social proof.

To help ensure that the NHB truly benefit from being online, four emerging priorities must be addressed collectively:

1. A focus on inclusion, especially of those from marginalized and traditionally excluded backgrounds
2. Address root causes of the persistent gender gap
3. Build a safer online experience
4. Invest in more deeply understanding and designing for the needs and lived realities of the NHB.



These findings have been derived primarily from a qualitative in-person survey of 15,000+ respondents from lower income households across India. This survey has been supplemented by enterprises surveys of ~100 supply side respondents, in depth human centred design interviews of 30+ NHB individuals, expert inputs and secondary research.

# Letter from the authors

Dear reader,

**For nearly two decades, many people have been working tirelessly to realize the promise and potential of digital access to improve the lives of Indians.**

Policymakers, technology providers, civil society organizations, private investors, and philanthropic funders have invested billions of dollars to build a digital India. Thanks to these investments, we now not only have near universal internet coverage, affordable prices, and a vibrant start-up ecosystem, but we also have some of the most impressive enabling digital public infrastructure in the world—e.g., Aadhaar and UPI. At the time of the study, ~800 million Indians are online (that is, have access to a phone and data), 1.3 billion have Aadhaar<sup>1</sup>, and there are more than 10 billion UPI transactions taking place each month.<sup>2</sup>

**Have these efforts actually helped people—particularly those who are lower-income or less advantaged—live better lives?**

We have not had clear answers so far. Our understanding today draws almost entirely on insights from the first wave of internet adopters, i.e., urban people who are relatively well off. We know very little about whether, to what extent, and how being online has improved the lives of people who are less well off—for instance, has it helped them earn more income, gain a better education, or increase their agency? We similarly do not know the collective impact of greater connectivity: has it helped India become more equitable?

**We set out to answer this question through the perspectives of the “Next Half Billion” (NHB).**

The Next Half Billion refers to India’s second wave of internet users, a group that was predicted to be crucial to India’s growth and inclusion story (see *Innovating for The Next Half Billion*).<sup>3,4</sup> In this study, we focus on—and refer to in shorthand as the NHB—those who have come online for the first time since 2017 and are from lower-income households (in the bottom 60% of India’s income distribution). As of August, 2023, 275 million Indians match this description.

**This study uniquely offers a panoramic view of the NHB’s experience with digital.**

It is the largest (covering 15,000 people across 21 states, as well as nearly 100 technology companies), most comprehensive human-centered study on the digital lives of the next half billion internet users in India to date. We cover peoples’ experiences across multiple dimensions of their lives: from skilling to engagement with government services to their individual agency. We capture their experiences not just as users of the internet, but also as entrepreneurs and content creators. We not only track access and usage, but also trace users’ experiences all the way to impact, allowing us to begin to see the interplay between various aspects of a person’s digital experience. This study also draws and builds on the multiple studies and initiatives that we have led over the years, which explore how Aadhaar, government entitlements, and digital public infrastructure have influenced the day-to-day lives of Indians.

<sup>1</sup> UIDAI, 2023

<sup>2</sup> NPCI, 2024

<sup>3</sup> ONI, 2017

<sup>4</sup> Over 90% of the ~300 million (ICUBE, 2022) users who have come online since 2017 are expected to be Next Half Billion users from lower-income households.

**Our ambition is that the data from this study will help those who are shaping India’s digital future to better understand, prioritize, and serve the NHB.**

We invite readers to take away the following key messages:

- **Investments in our digital rails are paying off.**

Over 90% of households, even in rural India, are now connected. A majority of the NHB have their own handsets. There has been a threefold increase in the NHB using digital payments since 2021. People no longer cite affordability as a major challenge. Most people say that digital government services work and that they are able to use government services such as updating ID and accessing schemes with ease (in addition to this study, see other studies by Dalberg on State of Aadhaar, access to entitlements, etc).

- **Being online is helping the NHB live better, more meaningful lives.**

Over 100 million of the NHB say that their standard of living has improved because they are online. Nearly one in six people say that they have experienced not just material gains, but also gains in their individual agency and how they engage with the outside world. For example, the NHB with disabilities seem to be benefitting more than the average NHB user. A large portion of NHB businesses are using the internet to grow their customer base and reduce operational costs. All in all, 2 in 5 of the NHB report a net positive impact of coming online. The pace of this change—in the span of just a few years—is remarkable and speaks to people’s ability to use digital to take their lives into their own hands.

- **But these stories of change are counterbalanced by how our digital ecosystem seems to be reinforcing existing social inequities.**

The gender gap is not closing and over 140 million women remain offline, despite living in connected households. Similarly, older members of households also remain disproportionately offline. Nearly 30% of people told us that they experienced harms on a recurring, regular basis and that they experienced persisting negative impact afterward, or had to invest significant time and resources to overcome it. One in eight of the NHB report facing a net negative impact from being online, in addition to ~45% who experience no impact or a neutral impact only. The NHB shared that low product relevance holds them back from using the internet and that most of them need help while using new apps and services. For the most part, the people who are benefiting the most are those who we would expect to benefit: urban, more educated men and entrepreneurs.

**Our investments in digital are paying off, and we now have some of the most impressive digital public infrastructure in the world**

**But to realize the full potential of digital for all people, we need to move beyond technological solutions. We need to now shift focus to addressing the underlying human challenges that remain**

- **If we want to be serious about realizing the full potential of digital for all people, we need to shift our approach to addressing the human challenges that remain.**

Our study identifies four areas of focus: (1) prioritize inclusion—especially of traditionally excluded and marginalized groups—in the design of digital infrastructure, products, and services; (2) address the root causes of the persistent gender gap; (3) build a safe online experience, and (4) continue to deepen our understanding of the NHB and their lived experience online. These focus themes will help us address challenges that are not just technological in nature, but rather that stem from questions of human values—of who our society believes should and should not be online; of how we help those who are not yet comfortable online to navigate an increasingly digital society; of how we treat each other; and of how we truly understand and create products that are meaningful for the NHB. Our study highlights how crucial it is to address these challenges. Finally, it suggests new ways of working to help unleash the full potential of going online for India's Next Half Billion.

Thank you for reading Digital Access and Beyond: How being online is impacting the lives of Next Half Billion users. We hope you come away with a better understanding of this critical group and new insights and inspiration for your work. We look forward to continuing and deepening the conversation. Please reach out to us at [nhb@dalberg.com](mailto:nhb@dalberg.com).

Warmly,

The Dalberg team

## Letter from Omidyar Network India . . .

Over the last decade, our purpose at Omidyar Network India has been to support bold and purpose-driven entrepreneurs who are working to improve the lives of India's Next Half Billion.

The "Next Half Billion" or NHB are the second wave of new internet users coming online for the first time through their mobile phones, predominantly from the bottom 60% of India's income distribution. We believe the NHB represent an aspiring India and will define our country's trajectory of growth, well-being, and prosperity.

To deepen our own and the wider impact investing ecosystem's understanding of the NHB and to better equip the entrepreneurs who are building products and services for this segment, we partnered with Dalberg to conduct an extensive listening exercise. This study brings together findings from a first-ever nationally representative survey of over 15,000 NHB respondents across India.

This survey validates that the direction of change in India is towards greater access to information, economic opportunities, learning, communities, products and services through mobile-first businesses. Moreover, provision of public services through digital mediums has aided efficiency and acted as a leveller for the NHB, who otherwise face access challenges.

Notwithstanding the relative newness of digital products and services, 42% of the NHB have reported improvement in standard of living – which includes higher earnings, better health, education, and more choices by going online. Digital access has also been especially beneficial for traditionally excluded segments, like persons with disabilities who are 1.5 times as likely as others to experience transformative impact from being online.

While this study has reinforced our belief that tech has been an enabler of social good, it also tells us that we need to double down on making it work for every Indian. Digital inclusion for women remains a key challenge – 150 million women are still offline, and the gender gap in internet access has increased from 2017 (when there were 45 million more men than women online) to today (the gap is now 80 million).

Ensuring a safe digital experience is also a rising issue, with 55% NHB having experienced some harms from being online, and a striking 28% of the NHB not using a digital service due to concerns related to safety. Enabling access for women and investing in digital safety and privacy, especially for vulnerable groups, are the hard challenges for the next five years.

These findings shine the spotlight for a broader set of stakeholders to collaborate and rally around the most pressing needs in India's digital journey, especially for the currently underserved segments within the NHB. This study gives us an updated blueprint for the unfinished digital agenda for India – going beyond access to meaningfully improving lives of every Indian through the power of digital connectivity.

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This report would also not have been possible without the valuable contributions of many experts and advisors.

## THE MAKING OF DIGITAL ACCESS AND BEYOND, 2023

### Inputs from 25+ external experts

#### ENTREPRENEUR PANEL

Advised on research questions and insights more relevant for technology companies

Helped add context and nuance key insights and recommendations by providing valuable supply-side perspectives

#### ADVISORY PANEL

Provided a range of perspectives to ensure that the framing, key insights and recommendations from the study would be appropriately contextualized, build upon prior understanding of the NHB and be relevant to a wide range of stakeholder groups—from government to civil society

#### TECHNICAL PANEL

Helped ensure that sample was representative of the NHB

Advised on the statistical validity of the methodology and key analyses



Research design and questionnaire • Survey supervision • Analyses and report

#### IN-DEPTH SURVEY

15,512 NHB respondents in 21 states and union territories



#### ENTERPRISE SURVEY

95 supplier respondents



#### HUMAN-CENTERED DESIGN RESEARCH

30+ in-depth interviews with the NHB in 4 states



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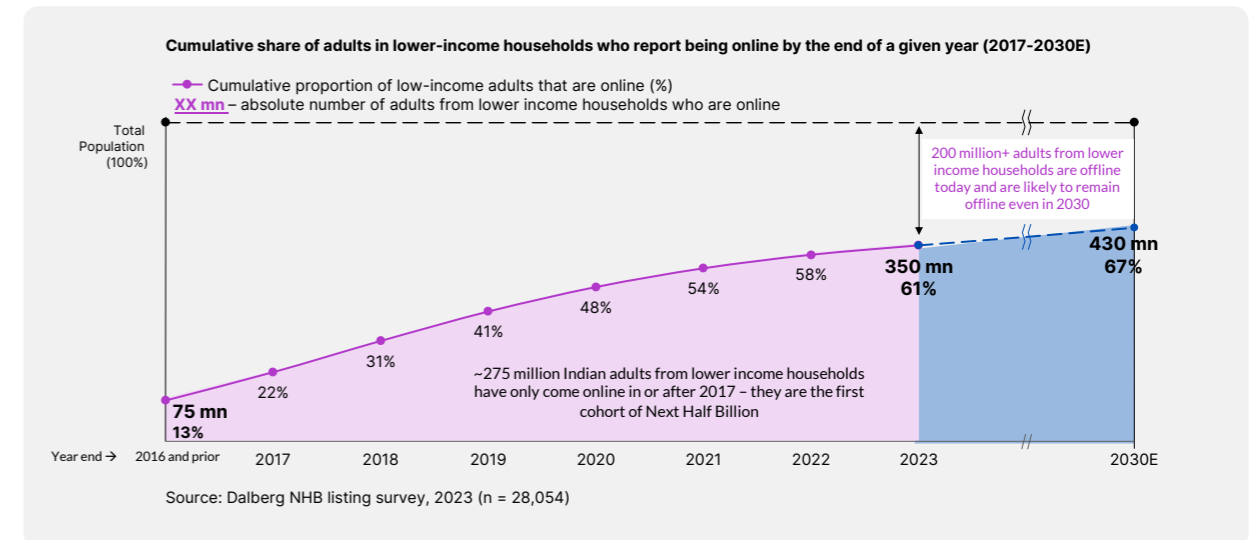
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# KEY INSIGHTS

## 1. Most lower-income households have at least one adult online, but bringing everyone within the household—especially middle-aged women—online remains a challenge

- 90% of lower-income households<sup>5</sup> and 60% of lower-income adults<sup>6</sup> are now online
- 275 million adults from these lower income households have come online only in or since 2017. They are the first cohort of Next Half Billion internet users
- More than 200 million lower-income adults remain offline. Women (142 million) and people over 40 years of age (143 million) are disproportionately offline



## 2. The NHB engage in a broad range of online activities—far beyond messaging and entertainment

- The NHB spend a median of three hours per day online
- On average, an adult engages in seven out of the 15 activities that we measured
- One-fourth or more of the NHB took part in each online activity covered in our survey (including job search, digital skilling, e-commerce, e-mobility, and e-government). In fact, seven times as many NHB use digital payments and 40 times as many use e-commerce today as in 2018
- 20% (approximately 55 million) of the NHB are power users: they engage in almost all 15 of the online activities we measured. A further 36% (approximately 100 million) engage in all basic activities measured, as well as some advanced activities<sup>7</sup>

Figure >

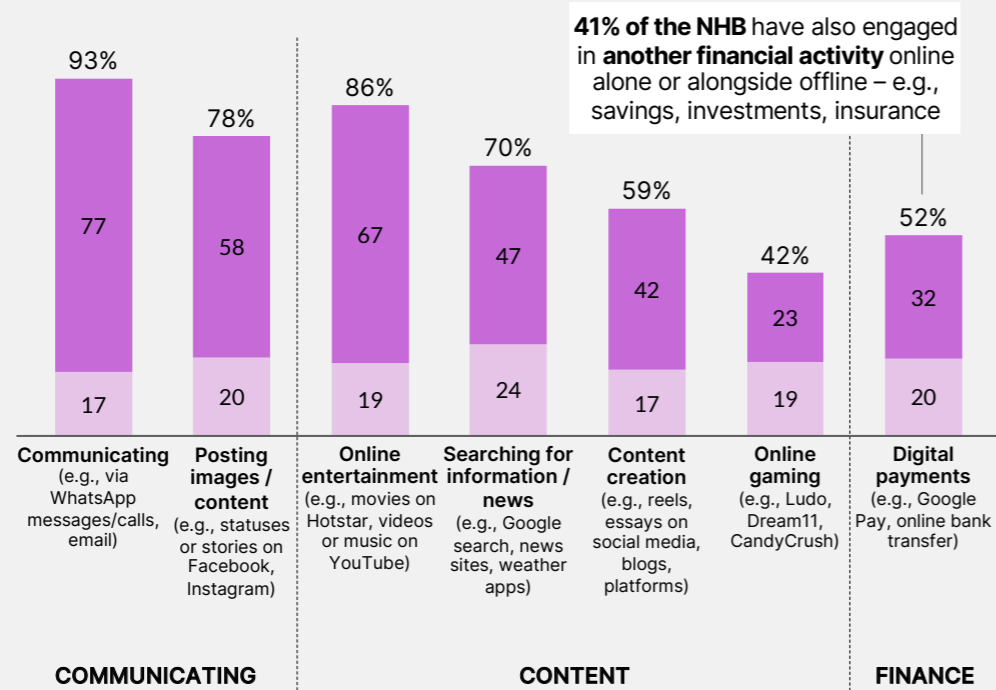
<sup>5</sup> We define lower-income households as those belonging to the bottom 60 percentiles of India's income distribution. In practical terms, we sampled households in rural areas and in low-income urban areas for our survey. (For more detail, please see the Detailed Methodology Note.)

<sup>6</sup> We refer to individuals who belong to lower-income households as lower-income individuals regardless of their personal income level.

<sup>7</sup> Basic activities include communicating online, posting on social media, watching content, searching for information, playing games, and creating content. Advanced activities include digital payments, e-commerce, online transportation services, online public services, online job search, online skilling, online health consultations, searching for health information, and digital tools for work.

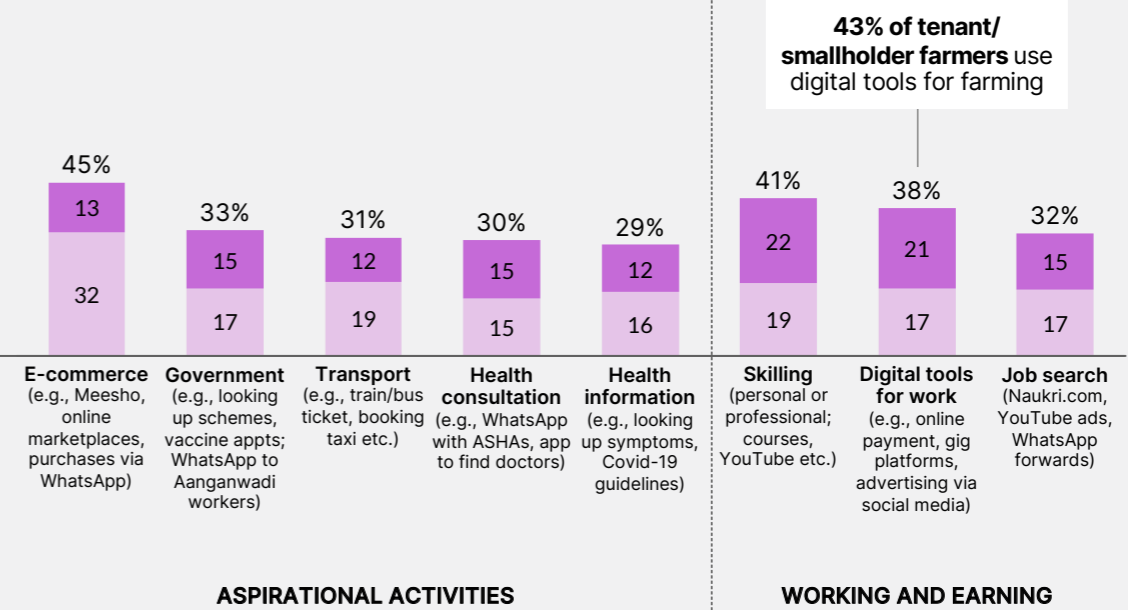


Percentage of NHB who report conducting each digital activity



Source: Dalberg NHB Main Survey (n = 15,512)

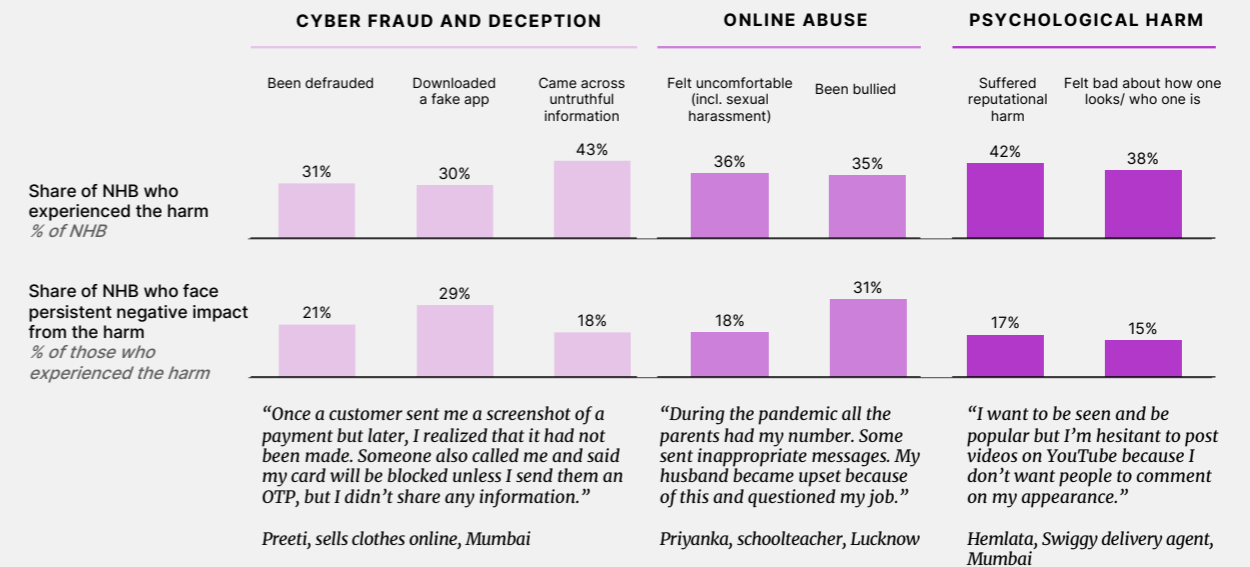
**Frequent users** (conduct the activity several times a day/week)  
**Infrequent users** (conduct the activity monthly or less)



### 3. Online harms are severe and widespread, but remain inadequately understood, prioritized, and addressed by tech actors

- Over 50% of the NHB have experienced at least one instance of fraud, harassment, bullying, reputational harm, negative self-image, misinformation, or downloading a fake app online in the last year. Twenty-four percent have experienced all of these harms
- 25% of those who experienced online harms faced severe negative impact. For example:
  - 29% of those who were bullied say the incident continues to impede their daily lives and/or required significant time and resources to resolve
  - 24% of those who faced fraud lost Rs 2,000 or more; 3% lost Rs 12,000 or more (equivalent to the average NHB household's monthly income)
- 22% of the NHB would like to but do not engage in additional online activities because of safety concerns. A further 6% of the NHB have stopped using a service due to a safety concern or harm
- Yet, less than 10% of technology firms serving NHB customers see harms like online abuse (bullying, harassment) or negative self-image as a significant risk to their users; a majority (more than 60%), however, recognize the severity of financial fraud

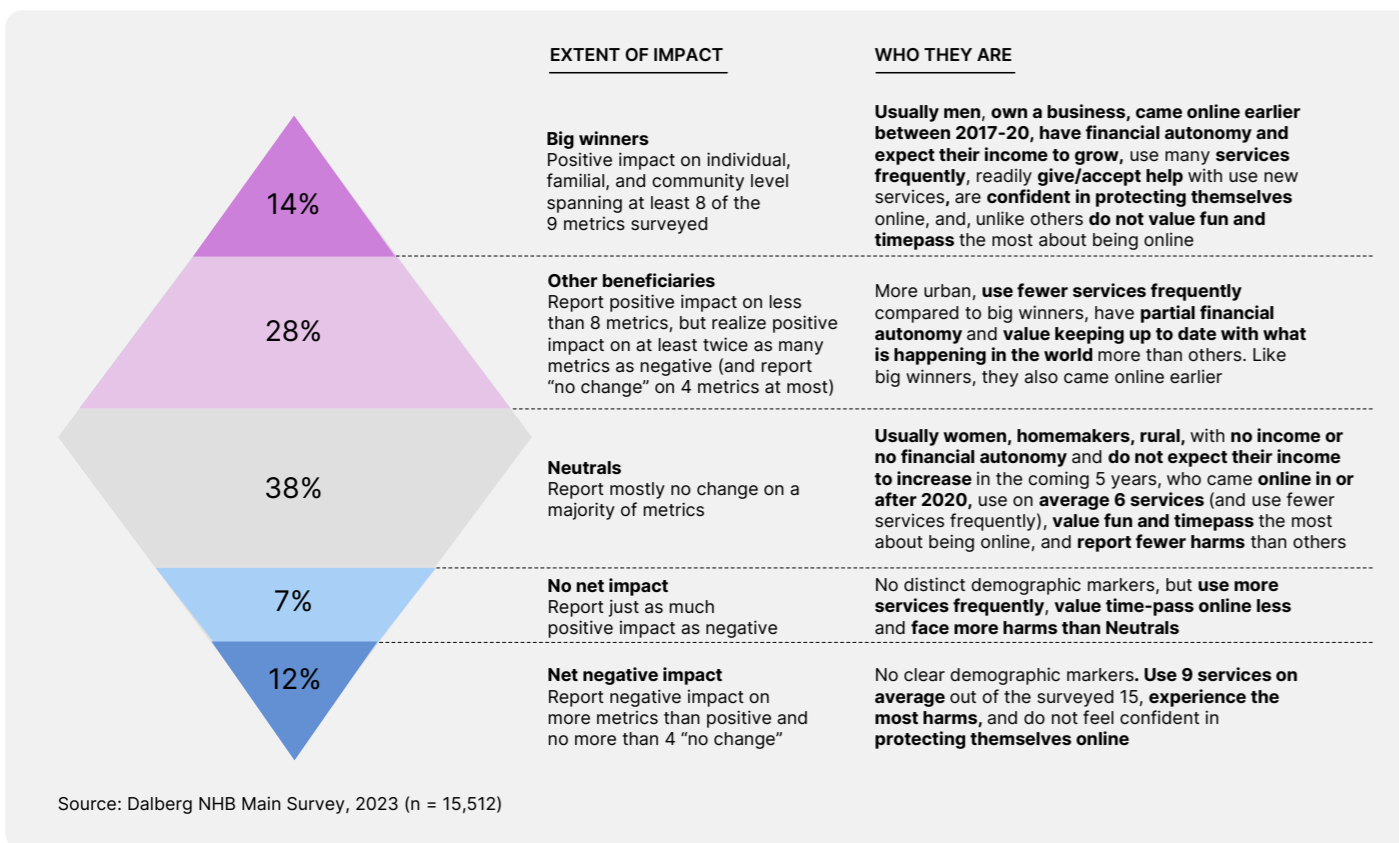
Share of NHB who experience harms – and impact on their lives



Source: Dalberg NHB Survey, 2023 (n = 15,512)

#### 4. Just under half of the NHB report a cumulative positive impact from going online, while just over half report little or negative impact

- 42% of the NHB experience a cumulative positive impact across multiple dimensions from being online; 46% report little or no impact; 12% report net negative impact
- 14% of the NHB are “big winners”—they experience transformative positive impact from being online, i.e., they benefit across all or almost all dimensions. Men, business owners, and those with financial autonomy are disproportionately winning compared to other groups and the NHB as a whole
- Engaging in a broader range of online activities is associated with greater impact, both positive and negative; net negative impact is also associated with experiencing more online harms (including fraud, harassment, and misinformation)



#### 5. Expansion of social networks, increased autonomy, and improved standard of living are among the most commonly cited positive impacts from going online

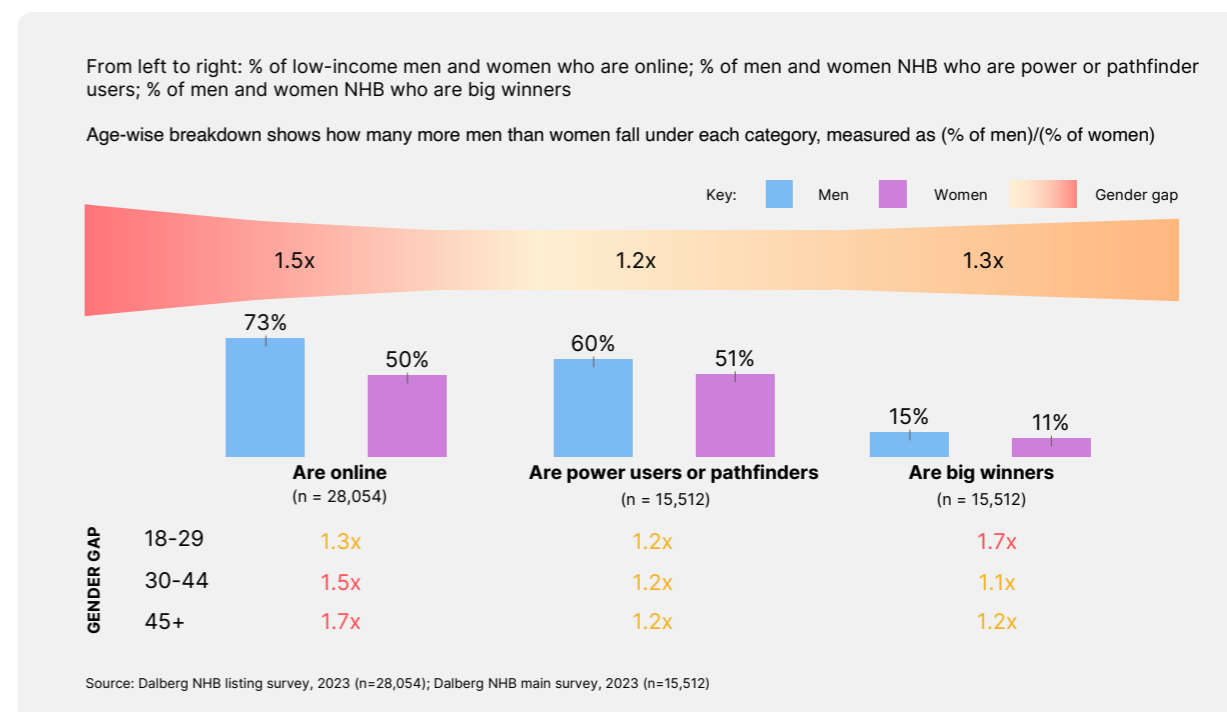
- The most frequently reported benefit of going online was an increase in the number of personal connections (57%)
- Being online has had a net positive impact for the NHB’s standard of living (44% report an increase; 12% report a decrease; 44% report no change)
- Many of the NHB report that going online has increased their awareness of the world, their personal credibility and ability to influence others, and their confidence moving around outside of their homes

#### 6. NHB entrepreneurs are among the biggest users and the biggest winners online, and they hold potential for even deeper engagement

- One in two NHB entrepreneurs run their businesses using digital tools, usually online ads and digital payments; close to sixty percent of them report increased business earnings and smoother operations due to being online
- 1.25 times the share of NHB entrepreneurs are “big winners” and “other beneficiaries” as compared to the rest of the NHB
- 33% of NHB entrepreneurs who do not use digital business tools would like to try them—but are constrained by slow or unreliable internet, difficulty in finding relevant tools, and safety concerns

#### 7. Even as more women come online, the gender gap is not closing. Addressing it is both an inclusion imperative and a market opportunity

- Among lower-income individuals, 1.5 times as many men as women are online, across all age groups. This is the case even after 113 million women have come online since 2017
- The gap extends to usage and impact. Men spend 30 more minutes per day online, 1.2 times as many men as women are “power users” or “pathfinders,” and 1.3 times as many men as women are “big winners.” On the other hand, more women are “passive” users and report neutral impact of going online on their lives<sup>8</sup>
- Closing the gender gap could unlock a new customer base for digital service providers. Yet only 50% of enterprise survey respondents consider women a current or future priority



<sup>8</sup> “Power users” or “pathfinders” are usage-based classifications; please find a comprehensive definition in Chapter 3: What the NHB do online? or in the Glossary of terms. “Big winners” is an impact-based classification; please find a comprehensive definition in Chapter 6: What is it all for? or in the Glossary of terms.

**8. Traditionally excluded groups can reap large benefits from going online; but they are also particularly vulnerable to online harms**

- NHB with disabilities include a 2.7x greater proportion of power users than the rest of the NHB. However, people with disabilities faced all of the surveyed harms three times as frequently as others in the NHB
- Transgender NHB include a 1.7x greater proportion of power users than the rest of the NHB. However, they face 1.4 times as many harms as the rest of the NHB, and they have twice the share of people who experience net negative impact from being online

**9. Digital product relevance and NHB-friendly design remain key challenges for technology companies and the NHB alike**






- The NHB's main barriers to engaging in more online activities are product relevance (cited by 79%), design (64%), and reliability (54%)
- Related to this, many supply-side actors say that they struggle with low user awareness of product features (70%), discovery challenges (61%), language barriers (60%), and frequent drop-offs during onboarding (50%)
- Key features that can improve NHB engagement include:
  - More responsive, flexible voice and language features (including support and recourse, which remain largely in English or Hindi today)
  - Simplified, safe app download and installation pathways
  - Creating hyperlocal social proof through demonstrations and guided usage
  - Micro-payment models
  - Greater in-app privacy and user controls

**Reflections on the journey ahead »**

**Focusing on four key priorities is key to ensuring that the NHB benefit from being online and enabling more equitable societal outcomes.**

- Prioritize inclusion for all—especially of those from traditionally excluded, marginalized, and disadvantaged backgrounds—by building bridge “phygital” solutions and leveraging digital public infrastructure (DPI)
- Address the root causes of the persistent gender gap by tackling restrictive social norms; prioritizing digital gender inclusion and gender sensitive education among younger people; and promoting safe, gender equitable digital experiences
- Build a safer online experience by protecting against harms more holistically, treating safety as a key business priority, and establishing clear accountability
- Invest in deepening our understanding of the NHB's needs and lived realities by supporting additional research that can uncover new and efficient ways of working with NHB, and continuing to track the NHB's evolving digital experience

**We all have a role to play in achieving a digital future that better serves the NHB**

STAKEHOLDERS	KEY CONTRIBUTIONS
 <b>Civil Society Organizations</b>	<ol style="list-style-type: none"> <li>1. Continue to create safe private spaces and learning networks for women to explore digital services while also investing in grassroots efforts to challenge restrictive social norms</li> <li>2. Design and implement school level programs that introduce students to appropriate digital tools from an early age, teach and promote online safety and appropriate behavior, and normalize the idea that girls, too, have the right to be and benefit from being online</li> <li>3. Partner with policymakers to execute digital safety campaigns, especially for harms other than financial fraud</li> </ol>
 <b>Funders</b>	<ol style="list-style-type: none"> <li>1. Commit publicly to a strong gender lens and invest accordingly. Fund innovative partnerships to overcome gender norms</li> <li>2. Develop public goods for safety: technology, playbooks, tools that distill ecosystem lessons and facilitate better digital protection from harms</li> <li>3. Fund research on relevance and quality of digital services for the NHB. Invest in low-tech solutions that can help unlock additional market segments</li> </ol>
 <b>Policy makers</b>	<ol style="list-style-type: none"> <li>1. Prioritize digital literacy and safety education in schools, at an appropriate age, for all genders</li> <li>2. Expand the scope and regulation of digital harms to include psychological harms and emerging threats; increase accountability through harm reduction targets and liability for key actors</li> <li>3. Strengthen DPIs by setting and monitoring inclusivity targets and strengthening the digital safety rails</li> <li>4. Augment decentralized digital / phygital access points like Common Service Centers (CSCs) to provide a larger network, expanded service offerings, and higher quality service</li> </ol>
 <b>Researchers</b>	<ol style="list-style-type: none"> <li>1. Contribute to the development of new mental models and ways of working—e.g., a lexicon of digital harms with a spotlight on harms that are overlooked, under-prioritized, or nascent; or a repository of NHB-centric product design and go-to-market best practices</li> <li>2. Focused investigation of persistent challenges—for example, the relationship between digital adoption and social norms or the drivers and barriers of perceived relevance of digital technology among the NHB</li> <li>3. Track progress and identify the next priorities for the ecosystem—track success on identified priorities; underpin future longitudinal studies</li> </ol>
 <b>Technology providers and entrepreneurs</b>	<ol style="list-style-type: none"> <li>1. Develop and promote low-tech solutions that can work in settings with limited or no internet</li> <li>2. Develop (with CSOs) products and marketing that de-stigmatize women's online engagement</li> <li>3. Prioritize safety from online abuse, psychological harm, and future potential harms (e.g., from AI); invest in digital safety awareness campaigns and make safety a value proposition</li> </ol>

# ABOUT THIS STUDY

## Why we conducted this study

**We conducted this study to understand how being online has impacted the lives of the Next Half Billion.** The NHB—aside from their sheer strength in numbers—represent the latest frontier for growth and innovation: many come from households with little or no prior digital engagement and embrace technology enthusiastically, but also differently from early adopters. Because they belong to lower-income, less privileged households, the NHB also have the most to gain from the promise of an inclusive Digital India. If technology is to be

the great leveler that we hope it can be, then it needs to deliver even greater gains for the NHB than for those who came online earlier. And, while much has already been written about India's online story, there has been less emphasis on uncovering the experience of the NHB. Our study aims to fill that gap and critically show which aspects of digital engagement are working (or not working), explore how experiences vary across segments within the NHB, and call out emerging risks and opportunities.

## What we studied

**We sought to understand in detail the NHB's digital experience**—from how they are engaging in digital activities (see image below for list of activities studied) to the positive and negative impacts they experience from being online, as well as the underlying factors that drive impact. We also touch briefly upon who remains offline (digitally dark). Beyond considering the

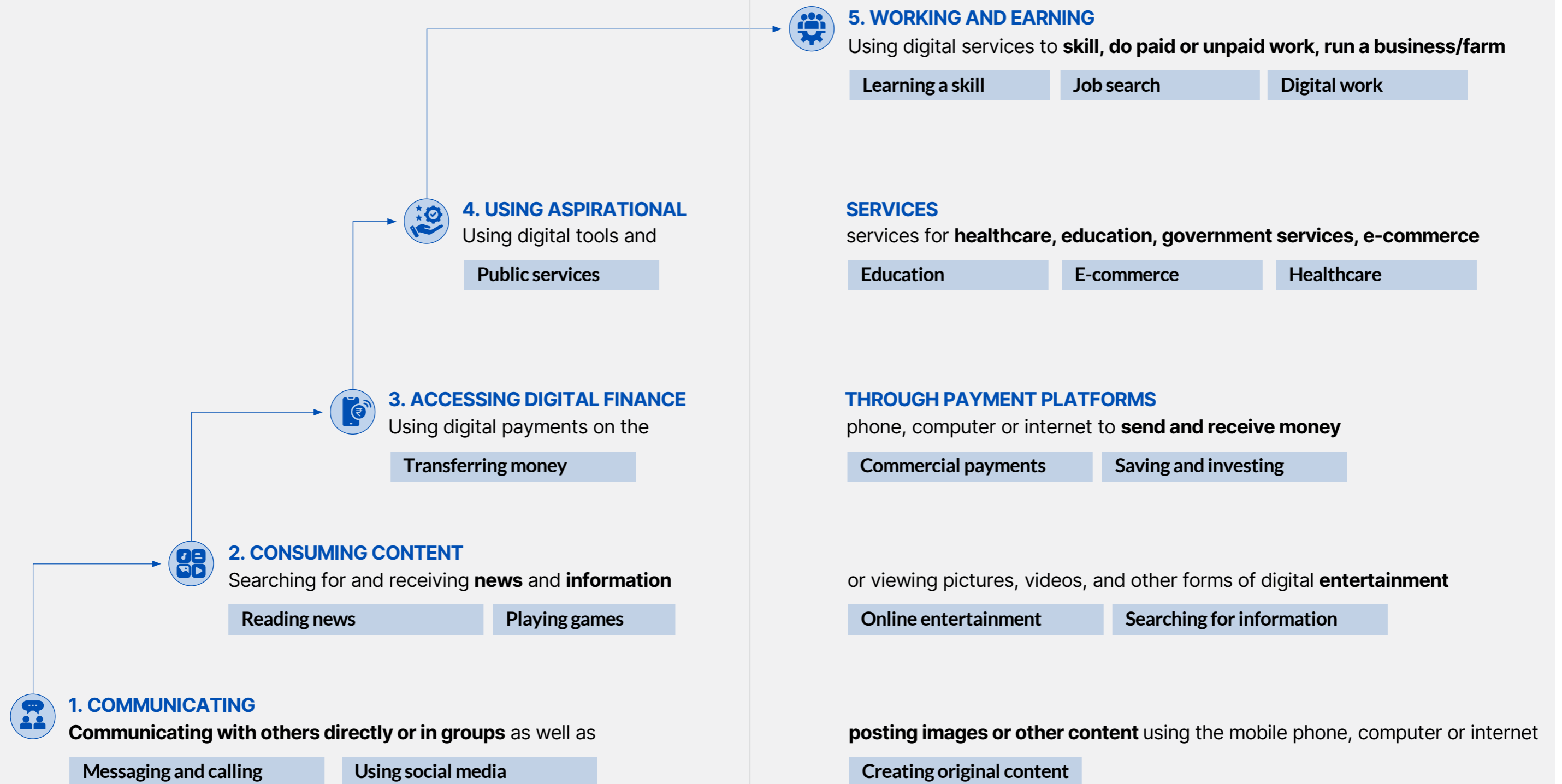
millions of NHB *en bloc*, our study attempts to understand the NHB by their demographics and digital behavior, and to trace how the digital experience varies for these distinct segments. Alongside this, we also attempt to unpack how well technology companies understand and serve the NHB (and what gaps remain).

Figure 1: Key research questions

- 1 Who are the NHB and who remains offline (**digitally dark**)?
- 2 How are the NHB **engaging with digital** services?
- 3 What is the overall **value and impact** the NHB are experiencing online? (**positive and/ or negative**)
- 4 What **unlocks gains**?  
What **holds people back** in their digital journey?
- 5 How well is the **supply side understanding and serving** the NHB?

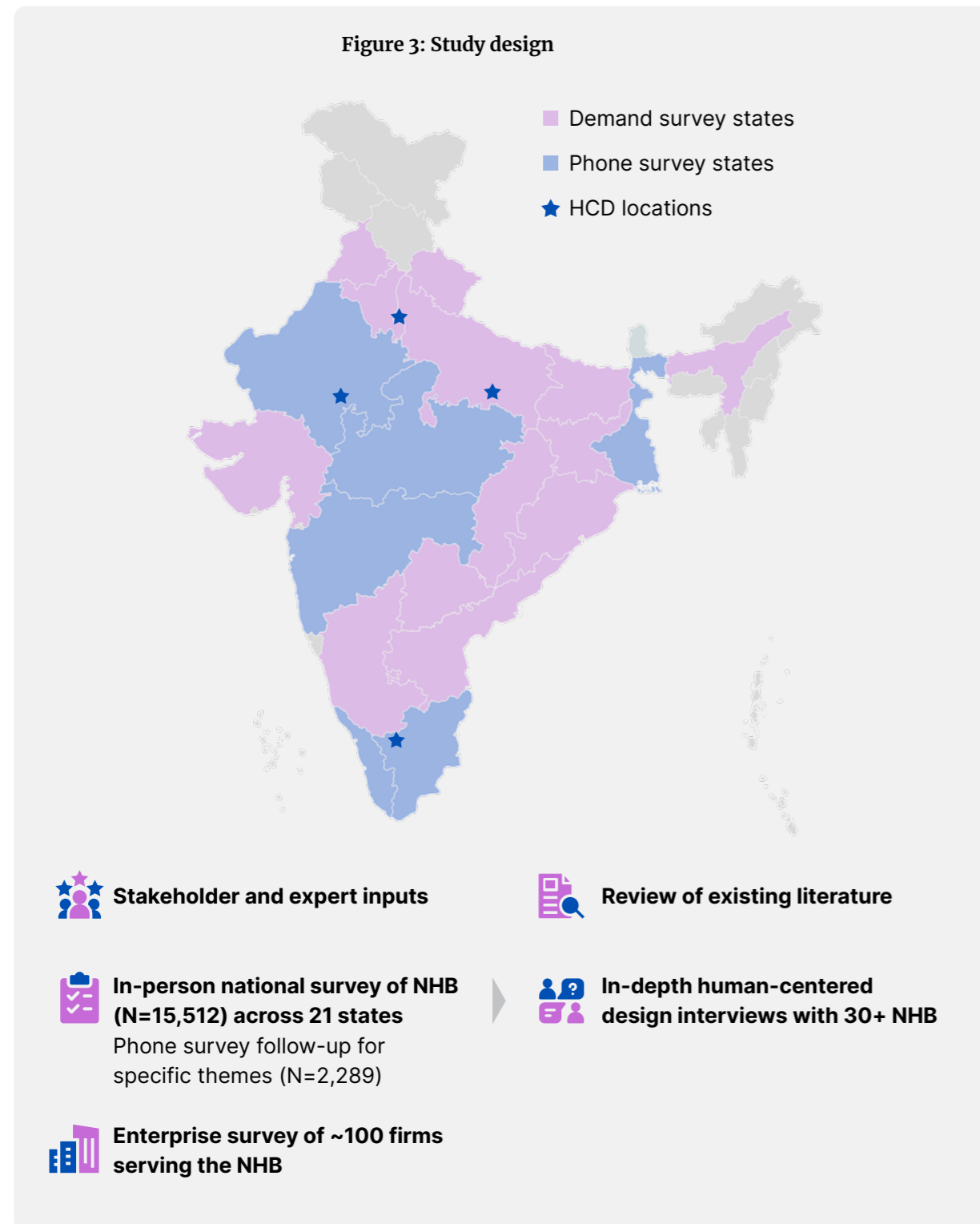
Figure 2: Digital ladder of activities

## DIGITAL LADDER OF ACTIVITIES



## How we conducted this study

To comprehensively understand the NHB's experience of being online, our study relied on multiple quantitative and qualitative inputs provided by both the NHB themselves and key stakeholders who engage with them, supplemented by insights from existing research. Specifically, we employed a mixed methods research design as described in Figure 3. Starting with a review of existing literature and key expert inputs, we undertook a first round of human-centered design (HCD) research to inform our hypotheses and the design of our surveys. We then simultaneously launched a national survey designed to be representative of the NHB and an enterprise survey of firms serving the NHB. We followed these up with an additional phone survey and a second round of HCD research to probe deeper into early insights and emerging data puzzles.



Dalberg conducted primary research, analysis, and reporting for the study, with financial support from Omidyar Network India and field research support from Convergent View. Data collection took place between November 2022 and August 2023.

In the interest of encouraging a data-driven discourse, raw datasets from the national NHB survey are publicly accessible on the Next Half Billion Study website. This report distills the key findings from the research, but far more data are available.

## Limitations of this study

Our study, like all studies, is limited by methodological and practical constraints. We find it important to note that:

- This is the first study to cover a novel population—the NHB—in depth. We did not have baseline data or other benchmarks specific to the NHB population. We have built a preliminary view, but future studies will be needed to refine and build on our findings.
- We focused on questions that our respondents could answer and relied on their reporting. We know, for example, that actual and self-reported screen time can vary widely. We also understand that some respondents who came online during the Covid-19 pandemic may have conflated their experience of the going online with their experience of the pandemic. Where we are aware of such potential discrepancies, we have called them out.
- As a point-in-time study, our research cannot establish causality and can only uncover correlations or associations between events (e.g., experience of harms prompting lower digital engagement, going online resulting in specific socio-emotional / financial benefits for NHB, etc.).
- Both our NHB survey and our enterprise surveys relied on the willingness of respondents to take part, which may have led to some biases. For example, it is possible that individuals who were more enthusiastic about digital themes were more eager to take part—and, by extension, those who were less enthusiastic about digital themes were less interested in participating. We know that our enterprise respondents were particularly passionate about the NHB and are (by design) not representative of the technology industry as a whole.

More detail on the methodology we followed can be found in the accompanying Detailed Methodology Note.

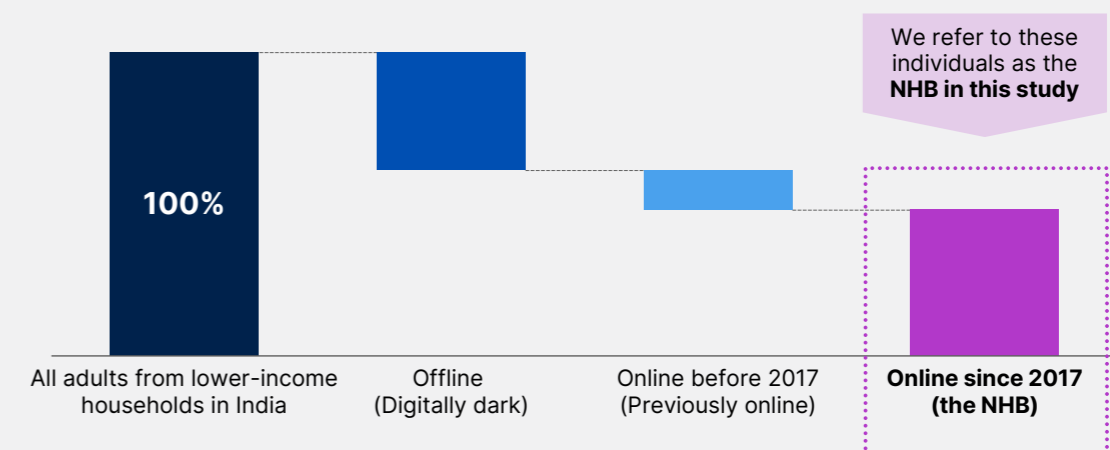
# DEFINING THE NHB

The Next Half Billion represent the second big wave of internet users in India, coming after the first wave which mostly comprised upper- and middle-income households. Collectively, they are the 500 million first-time internet users expected to come online via their mobile phones after the end of 2017. The Next Half Billion come from diverse, often low-income households, and include people who are small business owners of beauty salons and kirana shops, blue collar workers, domestic help,

security guards, farm laborers, and many more. This study shines a spotlight on the digital lives of the first cohort of nearly 275 million members of the Next Half Billion who have come online between 2017 and mid-2023 and are part of lower-income households (the bottom 60% of India's income distribution, earning less than Rs 17,000 per month in rural areas and less than Rs 28,000 in metros<sup>9</sup>). We focus on these individuals—and refer to them as the NHB in this study.<sup>10</sup>

Figure 4: Defining the NHB

Breakdown of lower-income Indian adults among online post 2017 (NHB), online before 2017, and offline (digitally dark)  
% of lower-income Indian adults



- Individuals belonging to **higher-income households in India** are **NOT NHB** (irrespective of when they came online)
- Individuals **online before 2017** are **NOT NHB** (irrespective of their income)
- Individuals who **remain offline** today are **NOT NHB** (irrespective of their income)

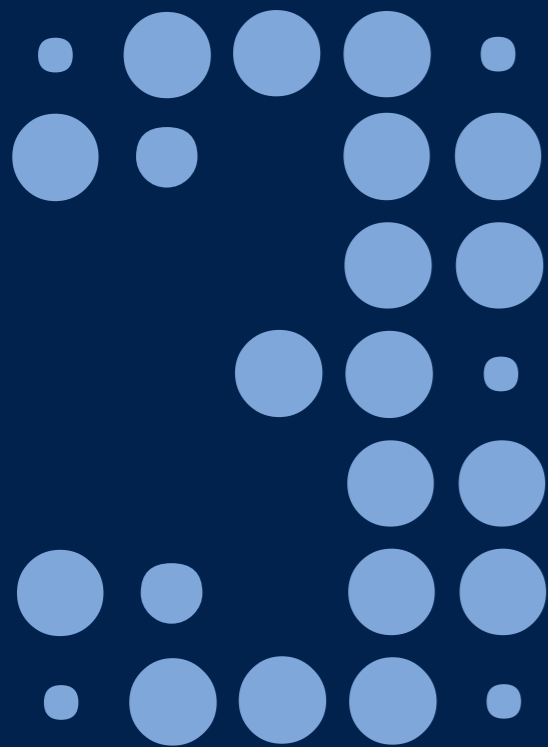
Source: Dalberg NHB study 2023

Note: lower-income households are those households that belong to the bottom 60 per cent of households by income

<sup>9</sup> As purchasing power and expenses vary across metros, larger towns, smaller towns, and rural areas, we also set different thresholds for income based on the location of respondent. For example, the monthly income threshold was Rs 28,000 per household in metros, Rs 24,000 in urban areas with populations of 1–4 million, Rs 22,000 in urban areas with populations under 1 million, and Rs 17,000 in rural areas.

<sup>10</sup> Some people from higher-income households also came online after 2017. However, lower-income households represent the vast majority (over 90%) of all of those who have come online since 2017. We focus on individuals from these households only.

# WHO ARE THE NHB: WHY INTERNET ACCESS IS NOW AN INTRA-HOUSEHOLD CHALLENGE



## Chapter summary

Over the past five years, close to 275 million of the NHB have come online, more of whom have been rural residents and many of whom have had lower education and literacy levels than India's first wave of internet users. Yet, over 200 million people (mostly women and 40+ year olds) remain digitally dark, even as the cost of being offline is rapidly increasing. Our study uncovers for the first time that most (87%) of the digitally dark are now in households where at least one adult is online, suggesting that

the digital divide is now an intra-household rather than an inter-household level challenge. Business as usual will not be sufficient to help the remaining digitally dark individuals come online. So far, many other studies have alluded to digital skills and literacy, affordability, and safety as barriers to digital uptake. Additionally, among the greatest barriers to address are social norms that shape who uses the internet and how.

**Keeping with optimistic projections from earlier years, 90% of lower-income household are now online** The large improvements in internet infrastructure and affordability over the past few years<sup>11</sup> have driven internet adoption: only 7% of lower-income households are completely digitally dark, i.e., they have no adult member online. This represents a huge leap since 2017, when 71% of households were still fully offline.

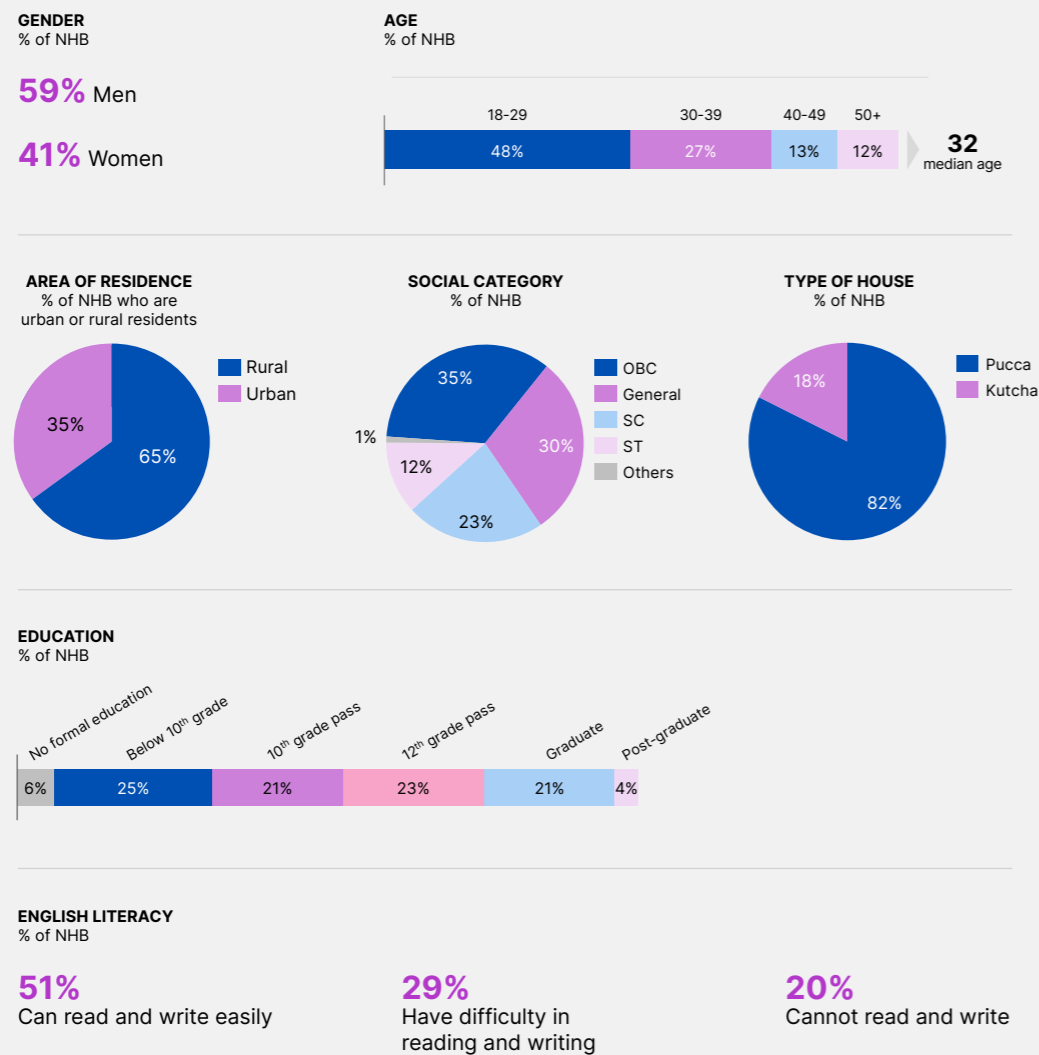
**Only 7% of lower income households are completely digitally dark today when compared to 71% in 2017**

**Nearly 275 million of the expected NHB<sup>12</sup> are now online; they are more diverse in terms of education, social category, and geography than earlier internet users.** Out of ~300 million total new internet users since 2017,<sup>13</sup> an estimated 275 million belong to the NHB, meaning they are from the bottom 60% of India's income distribution.<sup>14</sup> Women and rural residents are finally coming online in large numbers, and in recent years, their share has been growing slightly faster than that of men and urban residents. Social category may no longer be a predictor of online status: we found similar shares of SC/ST, OBC, and General category online. People with lower education and English literacy are catching up: 74% of the NHB have passed 12<sup>th</sup> standard or less. Forty-nine percent of the NHB cannot read English or can read only with difficulty; 14% are not confident reading or writing in their own language. Refer to figure 5 below for more details.

<sup>11</sup> Of India's more than 6.4 lakh villages, 6.1 lakh (95%) have internet connectivity today (Singh, 2023). Internet affordability has also greatly improved over the years (Jacob, 2022).  
<sup>12</sup> For the remainder of the report we will use "NHB" to refer to people from households in India's bottom 60 income percentiles who have come online since 2017.  
<sup>13</sup> GSMA, 2023a  
<sup>14</sup> We define "being online" as having ever gone online. NFHS 5 uses a similar definition, whereas GSMA defines being online as having gone online at least once in the last three months.



Figure 5: Demographic profile of the NHB<sup>15</sup>



Source: Dalberg NHB Main Survey, 2023 (n = 15,512)

**The majority of the NHB now own their phones and have adequate access to data; they are therefore in a good starting position to make the most of being online.** Almost all of them (85%) have their own phone with internet access. Most (67%), especially those who earn more, can afford enough data to meet their needs, paying an average of Rs 54 per month.<sup>16</sup> This is a significant change from 2017, when shared phones were far more common. For example, in 2015, 29% of Indian women borrowed handsets as an alternative to owning them,<sup>17</sup> while today we see fewer than 10% of NHB women sharing their phones.<sup>18</sup> Affordability of both phones and data was considered a major barrier in 2017; it appears to have improved for many people, even as cost remains a barrier for people who are not online yet.<sup>19,20</sup> Most of the NHB (60%) also have digital agency, i.e., they can go online independently without waiting for a device or asking for permission. However, 53% still need help to download or start using new apps.

15 In India, in 2023, men constitute 51% of the population and women make up 49%. Among the adult population, in 2021, 32% belonged to the 18–29 age group, 22% were 30–39, 18% were 40–49, 14% were 50–59, and 15% were 60+ (National commission on population, 2020). Hindus make up ~80% of India's population, Muslims account for 14%, and 6% are others (mostly consisting of Christians, Sikhs, Buddhists, and Jains). In 2021, OBC individuals accounted for 35% of India's population, 30% belonged to the general category, 25% to scheduled castes, and 9% to scheduled tribes (Sahgal, 2021). In 2019–21, 21% of India's 15–49-year-old population had no formal education, 37% had completed less than 10 years of schooling, 15% had completed 10–11 years of schooling, and 27% had completed 12 years or more (Ministry of Health and Family Welfare, 2022).

16 Average amount paid for data by people from households in India's bottom 60 income percentiles (OXFAM, 2022).

17 GSMA, 2016.

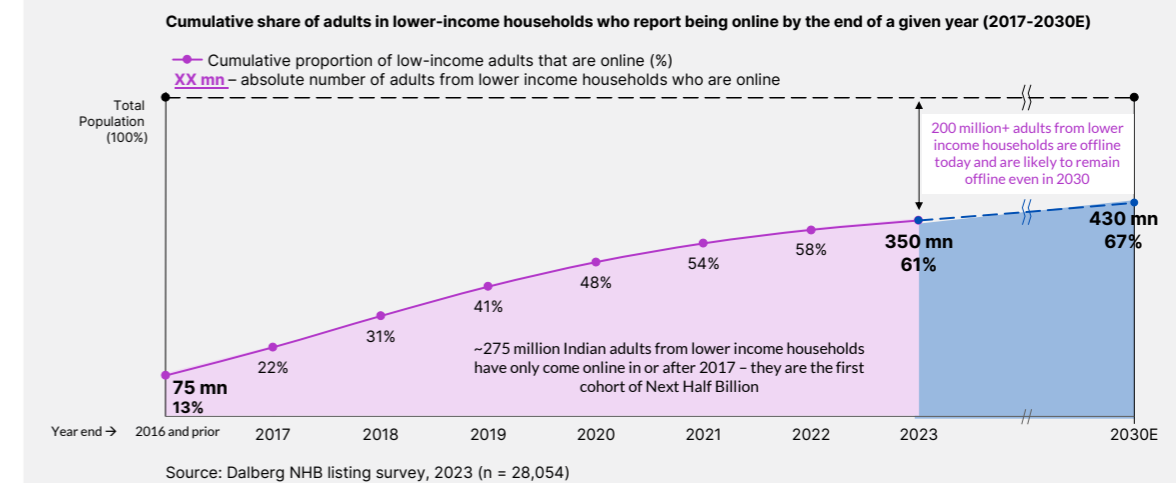
18 However, a gender gap remains for overall phone ownership in lower-income households: only 56% of women own a phone.

19 GSMA, 2017.

20 Omidyar Network India, Innovating for the Next Half Billion, 2017 (ONI, 2021).

**Still, internet adoption has fallen short of expectations. If current trends continue, a sizeable proportion of lower-income Indians will continue to be offline even in 2030.** Adoption started to plateau before the Covid-19 pandemic. While the pandemic temporarily heightened the need for digital connectivity, adoption slowed again afterwards. If current growth continues (following typical technology adoption patterns), only ~430 million lower-income Indians will be online in 2030,<sup>21</sup> while an estimated 210 million lower-income Indians will remain offline (as shown in figure 6 below).<sup>22</sup> The current trends of rising data costs and increasing smart phone prices suggest that even this estimate may be too optimistic.

Figure 6: Cumulative share of adults from lower-income households in India who are online



Source: Dalberg NHB listing survey, 2023 (n = 28,054)

**Today, an estimated 225 million lower-income Indians are not yet online: they remain digitally dark.** While the digitally dark were not the focus of our study, it is clear from our data (and that of GSMA, NFHS, and IAMAI, among others<sup>23</sup>) that we need a renewed focus on bringing all of India online.

**91% of those offline live in households where one or more other adult members are online**

**The people who are digitally dark are disproportionately women and middle-aged or elderly.** Despite an uptick in adoption, half of all women and almost two-thirds of those who are over 40 years old are still digitally dark. The relative access gap among lower-income Indians has narrowed slightly in recent years: in 2023, 1.6 times as many men as women are online (compared to twice as many in 2017).<sup>24</sup> However, in absolute terms, the gap has widened: today 79 million fewer women than men are online compared to 47 million fewer in 2017.<sup>25</sup> Even among the youngest adult cohort of the NHB, men are 1.5 times more likely to be online than are women.

21 This estimate is based on an S-curve adoption model and data from our NHB survey. The model suggests that internet penetration will eventually plateau around 68% of lower-income adults. By comparison, RedSeer expects 1 billion people (or 70% of the population) to be online by 2030 (including children and all income groups) (Kumar, 2023).

22 Data Input: Source - Census population projections | By 2030, there will be ~640 million lower-income Indian adults, 430 million of them should be online as per the estimate from the S-curve model (67%), leaving 210 million offline.

23 Sixty-six percent of adults have mobile broadband access (GSMA, 2022); 52% of overall Indians have used the internet in the past month (KANTAR & IAMAI, 2023); among 15-49-year-olds, internet usage rates are 51.2% for men and 33.3% for women (Ministry of Health and Family Welfare, 2022); 42% of households have broadband access within their premises as of 2023 (National Sample Survey Office, 2023). Regardless of various sampling methods and definitions, the rate of coming online is plateauing across sources.

24 Among those lower-income Indian adults, twice as many adult men as women owned a phone in 2017. This gap decreased to 1.6 times as many men as women in 2022.

25 1.4 times as many low-income adult men as women own their own phone. In India overall, 1.125 times as many men as women owned their own phone in 2022 (GSMA, 2023b). In its report, GSMA defines the gender gap in mobile ownership in terms of how much less likely a woman is to own a mobile than a man. This is calculated as (the proportion of adult men who own a phone - the proportion of adult women who own a phone) / (the proportion of adult men who own a phone). We have used GSMA's data to calculate the gap in terms of the ratio of the proportion of men who own a phone to the proportion of women who own a phone.

**Connectivity is no longer just a household-level challenge, but increasingly an intra-household one.** Roughly 30 million of the digitally dark lower-income individuals come from households that are fully offline (not even a single adult member is online). These households are among the poorest in the country (70% are from the bottom 30 income percentiles, earning less than Rs 13,000 per month) and are often rural. However, the vast majority of people who are digitally dark (87%) live in households with at least one adult who is online. The age and gender gaps described above combine to particularly disadvantage middle-aged and older women: three in four women over 45 years of age are still offline—regardless of income, religion, or caste. Most (69%) of these digitally dark women do not have their own phone. However, 91% live in households where one or more other adult members are online. This suggests that access can no longer be thought of simply in terms of connectivity or infrastructure. While our study does not focus on why the digitally dark remain offline, other studies suggest digital literacy and skills, affordability, safety, and security are all important barriers.<sup>26</sup> The biggest barrier of all may be prevailing social norms due to which women are either denied access by gatekeepers or themselves feel the internet is not relevant or attainable for them. Further research is needed to understand the interplay between literacy and affordability with social norms, and what might be needed to overcome these constraints.

■ **Stories behind our data**

**How restrictive social norms play into and reinforce affordability and literacy constraints**



Bala is a 38-year-old woman living with her husband and two sons in Dichaon Kalan. Bala's husband, who works as a driver, and both her sons (who are 21 and 16 years old) have smartphones. However, Bala uses a simple feature phone that does not have the ability to access the internet. Her sons regularly recharge this phone for her, which she uses only to make calls to her parents and relatives. Her family is dependent on her husband's income, which recently took a hit when he suffered an accident at work. Due to a tight budget, Bala wishes to "make do" with a basic phone for herself. Even if her family buys her a smartphone, she says she will not use it as she does not feel the need for one and doesn't know how to operate it. Moreover, she feels she is too busy with household responsibilities to take time out to learn how to use one.

*"I mostly stay at home, so I don't need a smartphone. Even if my son buys me one, I won't know how to use it. I'll take time to learn but as of now I have too much work at home."*

*"My son recharges my talk time from his smartphone. He also orders household items like shampoo and clothes online. I am able to do whatever else I want with my small button phone."*

**Bala, Dichaon Kalan**  
Left school after 8<sup>th</sup> standard • Homemaker

26 GSMA, 2023a.

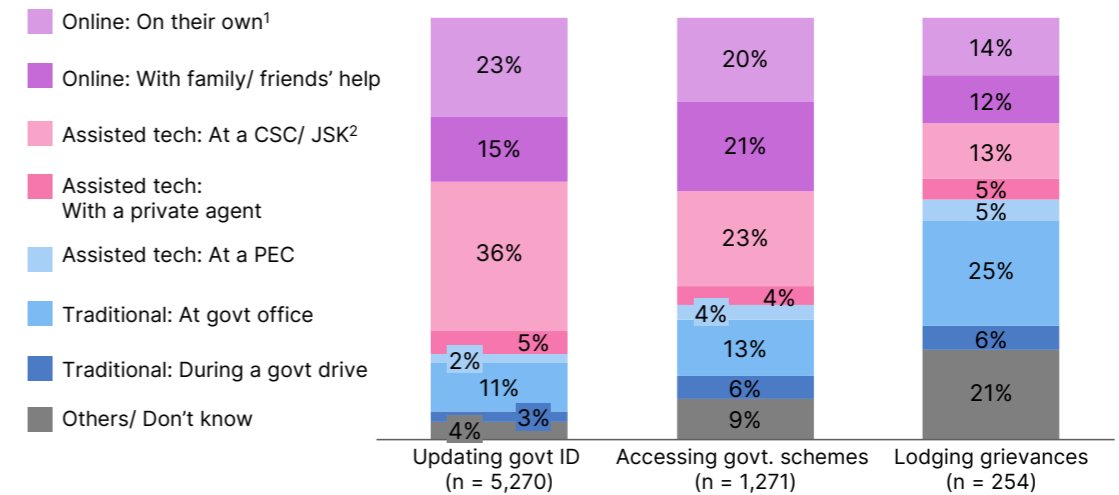
★ **Additional spotlight**

**What the NHB's experience with government services tells us about their preferences and needs**

**Figure 7: Accessing government services by channel**

**Share of usage of various avenues for accessing public services among NHB who access public services**

% of NHB who accessed each public service by avenue they used



Source: Dalberg NHB Main Survey, 2023

**The Government of India's push for Digital India is becoming a reality for the NHB—with the help of intermediaries.** The Government of India, through its Digital India initiative, aims to deliver government services digitally and has made strides in improving them since the mid 2010s.<sup>27</sup> Notable initiatives include the online MyGov platform, DigiLocker, etc. Many of the NHB have accessed government services online (32% in the last 12 months) and have done so successfully, with relative ease.<sup>28</sup> However, only 22% of them did so on their own; two in three needed help, mostly from local Common Services Centers (CSCs) / Jan Seva Kendra (JSKs).<sup>29</sup> And some (16%)—especially women, rural residents, and those with low English literacy—continue to rely on traditional offline channels.<sup>30</sup> Assisted solutions also make a difference to the NHB's experience with digital services—72% of NHB who accessed digital public services on their own were successful, compared to 81% of those who received assistance from CSCs / JSKs.

The NHB's experience with digital public services shows that while the push for digital is starting to bear fruit in terms of uptake, offline avenues and handholding support for those who are online remain essential.

27 India has advanced from rank 125 in 2012 to 105 in 2022 on the UN's e-Government Development Index, notably improving in the Online Service Index sub-component.  
 28 Seventy-one percent of them were successful in their endeavors and 52% found it easy (32% found it neither easy nor difficult).  
 29 Common Services Centers (CSC) or Jan Seva Kendra (JSK) are physical facilities that bring e-government services to rural / remote areas.  
 30 Traditional and assisted technology channels also remain important because many digital services still require some points of physical interface, e.g., for updating biometrics or vehicle registrations. Among the services we studied, updating ID (particularly Aadhaar) is the most online; this is reflected in digital usage by the NHB.

**Digital darkness need not mean exclusion.** Our study revealed many examples of individuals who may not themselves be online (or do not use a digital device for a particular activity), yet who nonetheless realize the benefits of digital technology by relying on support from more digitally confident family members or established intermediaries. While it may not be essential for everybody to be online, everybody must be enabled to come online should they wish to (making an informed choice). If not, there must still be assisted tech, low-tech, or no-tech solutions to ensure that they are not excluded.

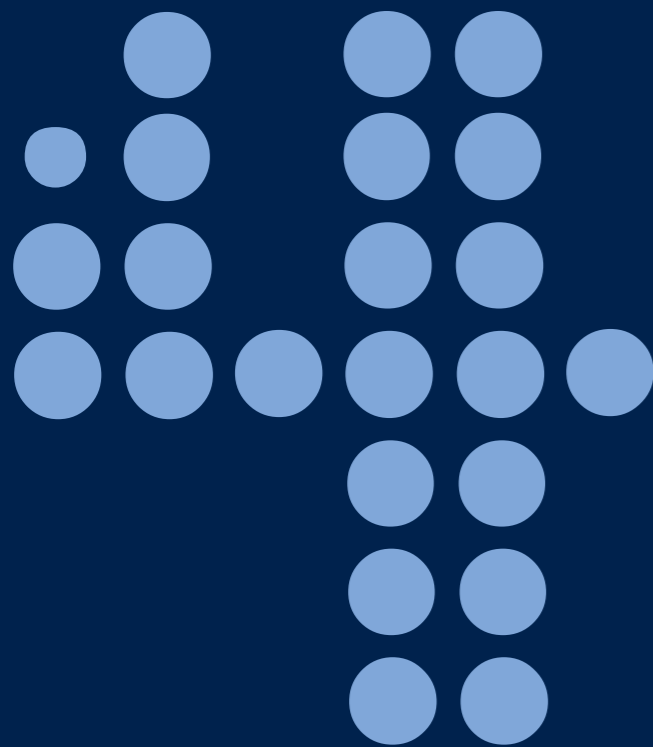
**The shortfall in internet access is especially concerning because being online is increasingly becoming de facto mandatory in India, and the consequences of being offline are therefore rising.** India is moving towards a “digital first” model, where essential aspects of daily life are moving online, from updating Aadhaar details to managing payments through the Unified Payments Interface (UPI). During the Covid-19 pandemic, this was further highlighted when online registrations were required to access vaccines. The further we go down this road, the more the cost of being offline increases. Those who remain offline will have reduced access to public goods in which the government or philanthropists are investing, especially in education (e.g., the National Digital Library of India or Khan Academy) and public health (e.g., Cowin registration and the e-Sanjeevini health portal). They risk losing out on the education and health benefits that these investments support. The digitally dark will also miss out on opportunities to participate in a surging digital economy. This makes it especially important to help the remainder of the population come online.

#### LOOKING AHEAD → →

The first cohort of the Next Half Billion are now online, having overcome digital divides shaped by their geography, literacy, and income. But more targeted and concerted efforts will be needed to help the next cohort of 200 million come online (especially those who are women and 40+ years old) while, in the interim, minimizing the cost to them of remaining offline.



# WHAT THE NHB DO ONLINE: THE BREADTH AND DEPTH OF THEIR ENGAGEMENT



## Chapter summary

In 2017, the conversation about the NHB was focused on simply bringing them online. Since then, the NHB have adopted communications and entertainment services enthusiastically. A large share of the NHB have become sophisti-

cated internet users, finding creative ways to improve their livelihoods, create content, and manage their daily lives. In doing so, the NHB are becoming a new market force—both as producers and consumers.

**More of the NHB than ever before are sophisticated digital users. They engage in a wide variety of online activities and have moved far beyond messaging and entertainment.** Even as the NHB might first come online to meet very specific needs, a typical NHB user eventually engages in 7 of the 15 activities<sup>31</sup> we studied. At least 25% of the NHB engage in each one of these 15 activities, and more than 33% engage in most of them (up from 15–20% of the NHB in 2017<sup>32</sup>). Almost all of the NHB use digital communications and entertainment; 59% create their own content. The majority use more advanced services as well, often finding them more convenient or affordable than offline options: 55% of the NHB have used at least one aspirational service, e.g., digital payments or e-commerce,<sup>33</sup> and 53% of the NHB have engaged in at least one working and earning activity online, e.g., using digital tools for work or to gain new skills.<sup>34</sup>

**The NHB engage online often.** Most (89%) go online daily or several times a week, typically for three hours per day.<sup>35</sup> This is similar to the pre-pandemic average of mobile-phone-based online activity for all India (including the first wave of higher-income users).<sup>36</sup> Half of the NHB users who engage in any of the online activities we studied do so once a week or more. Young urban men spend the most time online—4.2 hours per day on average.<sup>37</sup>

**Those with the deepest usage are typically younger men who have been online longer. Still, a significant number of the NHB have managed to leapfrog the usage of those who have been online longer.** Unsurprisingly, a greater number of years online correlates with engaging in more—and engaging more deeply with—online activities: those NHB who came online in 2017 and 2018 engage in more online activities than those who came later, and 37% more of them use aspirational services and digital working and earning services. The most deeply engaged users are often the NHB in urban areas, who use digital payments, digital tools for work, online transport services, and other aspirational or working and earning services far more than others. At the same time, we see encouraging signs of new users leapfrogging ahead.

More than a third of the NHB who came online in 2020 or later have already started using at least one aspirational or working/earning service, suggesting that the path up the digital ladder has shortened.

31 We asked respondents about the types of activities in which they engage. We therefore report on categories of use, not individual apps.  
32 Source: ONI Analysis based on ONI and 60 Decibels survey of investees, 2021–22; PRICE ICE 360 household survey 2021, and CMIE household panel survey, 2021 (60 Decibels & ONI, 2023).  
33 We consider e-commerce, government services, transport, and health to be “aspirational digital services.”  
34 We define skilling, job search, and using digital tools for work as “working and earning activities.”  
35 The NHB spend a median of three hours online per day. The average time spent online is 3.3 hours per day.  
36 Hariharan, 2021.  
37 This is in line with other sources that measure the mobile-phone-based internet use of all Indians. Other sources that consider online usage across all devices, not just mobile phones, find that Indians are online up to seven hours per day, around the global average (Kumar, 2023).

## NHB gateways to digital today include digital payments and digital tools for work



Priyanka, a schoolteacher from Lucknow, bought her first smartphone on EMI using her sister-in-law's credit card during the Covid-19 pandemic because her job required her to take online video lessons. Since then, she has also started to use Swiggy, Amazon, Google Pay, YouTube, Ola, and other apps.

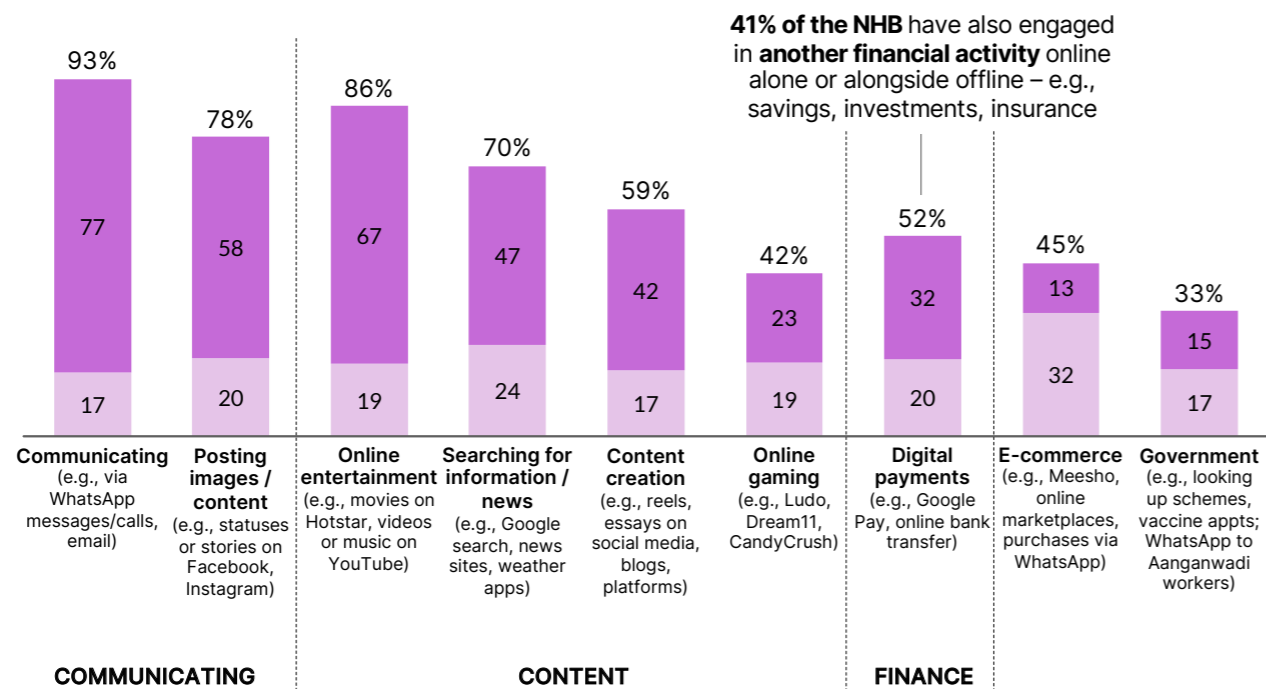


Similarly, Gauri, a flower seller living in Mumbai, bought a smartphone to receive digital payments from customers. She now uses WhatsApp, JioSaavn, YouTube, Swiggy, Meesho, Flipkart, and other apps—and wants to learn how to use Instagram.

## Digital engagement

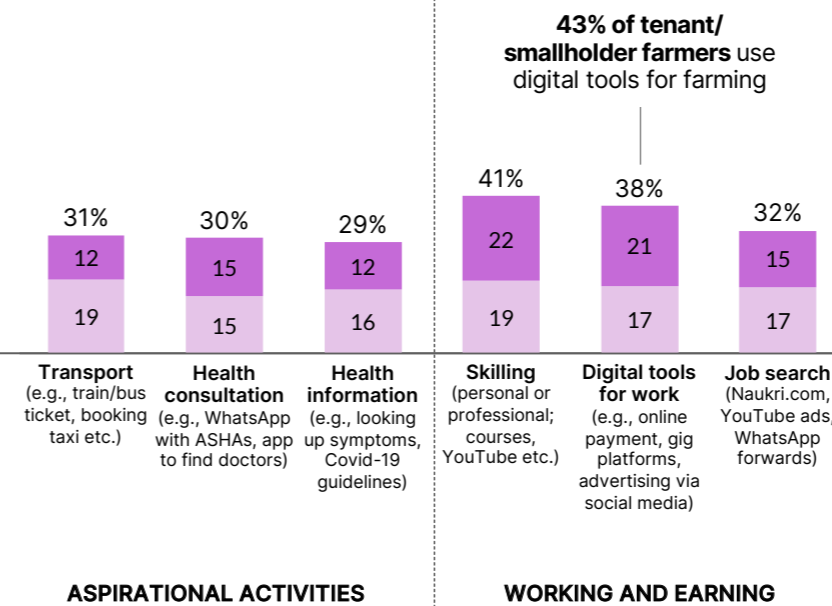
Figure 8: NHB's engagement in digital activities by frequency

% of NHB who report conducting each digital activity



Source: Dalberg NHB Main Survey (n = 15,512)

Legend:  
■ Frequent users (conduct the activity several times a day/week)  
■ Infrequent users (conduct the activity monthly or less)

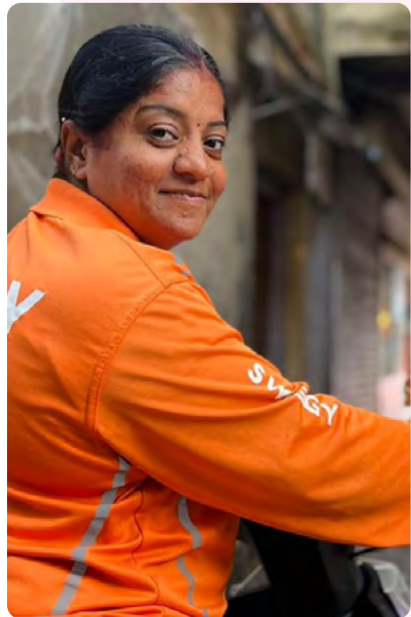


To understand how the NHB engage online, we asked about **activities<sup>38</sup> online, not about specific apps**. For example, we asked if they used online messaging and calling; we did not ask if they used WhatsApp or Telegram. This means that when we ask about health services, our respondents may be using WhatsApp to communicate with a community health worker, or they may be getting telemedicine appointments.<sup>39</sup> We felt that studying apps would limit our insights—especially in view of the NHB's highly creative use of simple apps for a large range of activities. Our HCD research, moreover, suggested that apps were less directly linked to impact than activities were.

<sup>38</sup> It was not possible to be completely exhaustive of all activities: we therefore chose to not include certain activities like dating, pornography, or fitness apps in our study given that they were either too niche as services, commercially already well understood, or difficult to explore via primary research.

<sup>39</sup> Please see the Annex for more information on the digital activities covered in the study.

## How digital tools can quickly become a cornerstone of the NHB's daily lives



Hemlata uses digital tools to earn money, secure better deals, run her household, and position herself as a role model. After losing her job during the Covid-19 pandemic, Hemlata turned to the internet to find a new one. Despite her husband and family's objections, Hemlata purchased a two-wheeler, learned how to ride it, and took up a job as a Swiggy delivery agent (after having also tried other platforms like Dunzo and Wefast). In her additional job as a real estate broker, she also uses WhatsApp to communicate with clients or advertise rooms for rent using the stories feature. Hemlata uses Facebook and browses multiple e-commerce platforms in search of the best deals (she once purchased a Rs 700 kaja for just Rs 1). She uses Simpl (a buy now, pay later service) to purchase items online on credit. She does this to build her credit history along the way and set herself up for taking an education loan for her children later. Interestingly, Hemlata has been able to deepen her use of the internet in the span of just 2-3 years, starting during the pandemic. She is also an avid content creator on Instagram, where she creates reels to share her story and inspire others.

*"Everyone's lifeline is a mobile and I want people to know that women, too, can do anything."*  
**Hemlata, 32, Swiggy delivery agent and real estate broker, Chembur Camp**

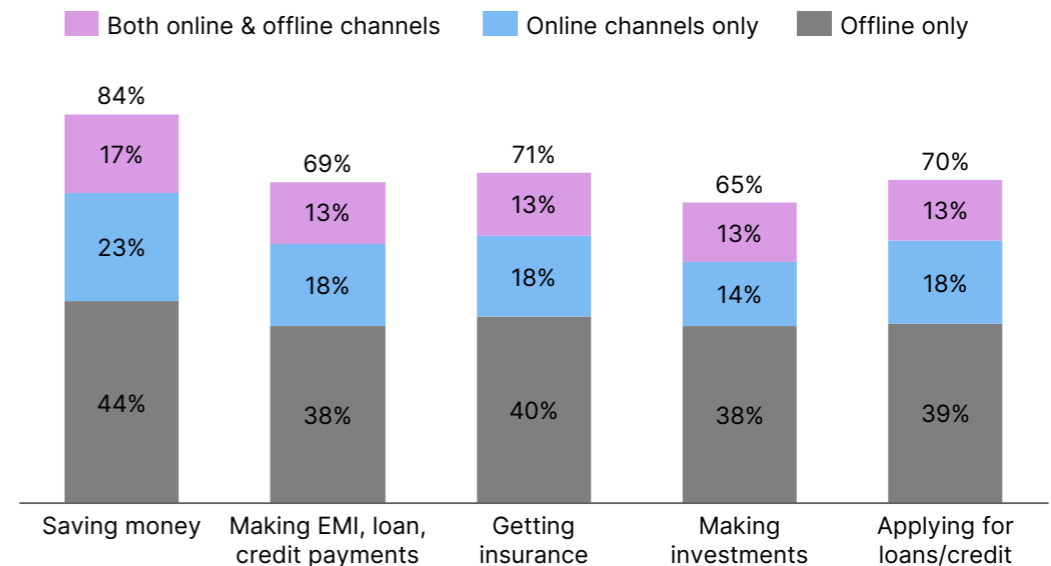
The extent of NHB digital engagement is not uniform—the NHB can be segmented into four key types of users based on the type of digital activities they undertake. At the higher end of the spectrum are power users (20% of NHB) who engage in most of the digital activities surveyed. A further 36% are pathfinders who engage in most basic activities (primarily content and communication) alongside some more advanced services. At the lower end of the usage spectrum are aspirers who have started to use more advanced services (or exhibit a desire to do so) and passives who use digital services only for communication and entertainment. The following pages offer more details on who these four segments of users are, what defines their digital behavior, and how being online is impacting them.

More than half (53%) of the NHB already use paid digital services,<sup>40</sup> mostly for entertainment, even if only a quarter actually directly pay for these services themselves.<sup>41</sup> In some categories, such as gaming, the NHB have overtaken India's early internet adopters.<sup>42</sup> The NHB are also active online shoppers: 44% overall—and 75% in metros—shop online; other urban (49%) and rural areas (41%) are increasingly catching up. In tier 2 cities and rural villages, online customers (NHB and non-NHB) were spending 16% of their income on e-commerce in 2022. Buying online has almost become the default for large aspirational items, such as new phones or televisions, even for many rural NHB households.<sup>43</sup> The convenience, speed of service, and lower prices offered by e-commerce platforms make them a preferred option for many of the NHB.

40 We do not include digital payments for offline products and services or payments for e-commerce purchases in this calculation.  
 41 Roughly 24% of Indians who access paid OTT content in India pay for it themselves directly. Others access via shared accounts or through telecom bundled packs, which in turn may be shared (Ormax, 2023).  
 42 Approximately 7% of Indians overall paid for gaming in 2021 (Source: EY & FICCI, Playing by New Rules, 2021) (FICCI & EY, 2021). In a survey of ~1,000 English-speaking Indians with access to the internet (skewed male, affluent, and educated), 25% paid for some digital news (Reuters Institute, India Digital News Report, 2019; Aneez et al., 2019).  
 43 Between 10% and 15% of the expenditure of the middle 50% of the rural income distribution is on aspirational consumption (e.g., new phones, purchase of appliances, etc.). For those who are regular e-commerce users and whose village is catered to by e-commerce services, the bulk of these purchases happen online (analysis by 1Bridge Advisors; Padaki, 2022; Shaw, 2022).

## Financial services online beyond digital payments

**Figure 9: NHB's use of online and offline financial services**  
 % of NHB who accessed each financial service through online/offline/both channels



Source: Dalberg NHB Main Survey, 2023 (n = 15,512)

**Digital technology is an important, but not yet dominant, contributor to financial inclusion; a small, mostly urban share of the NHB use online avenues exclusively.** With the rapid uptake of UPI, digital payments are top of mind in the financial inclusion discussion. However, the NHB also use other financial instruments online. Many of the NHB (27-40% across different services) who use financial services do so online. Around one in five urban members of the NHB access these services only online (compared to one in six rural members of the NHB).

*"Shopping online is cheaper because of all the offers. Even something as small as chocolate is cheaper online. You can also compare many products together from your own home."*

**Manoj, 39, travel agent, Bangalore**



### LOOKING AHEAD → →

While many parts of the digital ecosystem attract and serve the NHB, more can be done to deepen their engagement. This deeper engagement has the potential to create more impact and a larger market, but also carries the risk of new harms for the NHB, as will be seen in subsequent chapters. Growing the depth and breadth of NHB engagement responsibly needs to be a priority for the digital ecosystem.

We identified four types of digital users among the NHB, distinguished by their levels of engagement—both in terms of types of online activities and time spent online—and by the effects that going online has had on their lives.



### POWER USERS

They are discerning users who do just about everything online, including more niche activities. Digital tools are highly integrated into their daily lives, and while they derive the greatest value from being online, they also face the most harms.



### PATHFINDERS

Although they don't use digital as extensively as power users, they engage in a broad range of both basic and advanced activities, such as creating content, skilling, etc. They tend to be more educated and literate than aspirers and passives.



### ASPIRERS

They have only just begun using a few advanced services (usually e-commerce or digital payments), or they have a desire to do so. Some tangible utility often prompts this broadened use.



### PASSIVES

Their internet use is limited to the most basic activities such as communication and consuming content; they tend to be less technologically adept, usually have lower agency, and are less educated / literate than other segments. They derive the least impact from going online.

## Common digital behaviors

- Look for instant discounts or cash-backs when installing apps
- Delete apps if they do not have enough memory
- Value connecting with others the most about being online

- Rely on sources beyond friends / family to discover new apps and services (e.g., reviews or ads)
- Delete apps if they do not have enough memory

- Are more driven by utility than passive users
- Prefer apps that save time and delete ones that are not useful

- Rely on voice and avoid text / typing
- Many don't install or delete apps themselves
- Value fun and timepass the most about being online

*"I prefer GPay because it gives me the most cashback and FlipKart because it gives me discounts on my IDFC card."*

Hemlata, Swiggy delivery partner

*"I found the Care24 app from a Facebook ad, and I installed Gpay because everyone else was using it."*

Seema, healthcare worker

*"We used PhonePe during lockdown as we couldn't go to the bank. Online shopping and PhonePe save my time."*

Manjula, farmer

*"I use my phone for WhatsApp, movies, and general timepass. When I need to search for something I use voice. It's easier than typing."*

Rajesh, security guard

## Share of total NHB population (estimated number)

20% (55 million)

36% (100 million)

11% (30 million)

33% (90 million)

## Typical demographic profile

### Share of women NHB population

19% of women NHB

32% of women NHB

11% of women NHB

38% of women NHB

### Share of men NHB population

21% of men NHB

39% of men NHB

10% of men NHB

29% of men NHB

### % that can read/write English easily

64%

63%

45%

32%

### Other typical details

More educated, higher income, urban, formally employed or entrepreneurs. Half of all people with disabilities surveyed are power users

More educated, younger, students

Lower income (below 30<sup>th</sup> income percentile). More educated and urban than passive users

Less educated, older, rural. Homemaker, unpaid family business worker, or casual laborer with low financial autonomy

## Key online activities

At least 85% of power users engage in every one of the 15 online activities studied. This includes niche use cases such as booking health consultations and transport, job search, etc.

Communication, entertainment, posting on social media, searching for information, creating own content, digital payments, e-commerce, skilling, digital tools for work

Communication, entertainment, posting on social media, searching for information, digital payments, e-commerce

Communication, entertainment, posting on social media

## Other digital usage details

### % that came online before 2020

73%

68%

61%

52%

### Median time spent online (hrs/day)

4

3

2

2

### % that use a paid digital service

95%

66%

50%

43%

### % that use e-commerce

93%

55%

28%

6%

## Impact of digital usage

### High prevalence of online harms<sup>44</sup>

64%

19%

12%

9%

### % that say going online has increased their standard of living

52%

49%

44%

32%

### % that are "big winners" from being online

23%

14%

13%

7%

44 Share of NHB in each segment who have experienced all harms measured in the last 12 months.

# REACHING NHB WOMEN: AN INCLUSION IMPERATIVE AND A MISSED OPPORTUNITY

## Summary

Despite notable progress—more than 100 million Indian women have come online since 2017—the gender gap in access, usage, and impact endures across all age groups. The persistence of these gaps suggests that we need a new approach. Closing the gender gap is a social imperative, especially since access to the internet is increasingly seen as a human right.

**Even though more than 100 million women have come online since 2017, the gender gap in internet access is large and growing.** Today, only half of all women from India's lower-income households are online, compared to three-quarters of men. The relative gender gap has diminished: only 1.6 times more lower-income men than women are online today, compared to 2.1 times in 2017.<sup>45</sup> However, the reality in absolute numbers is less positive: today there are 78.5 million fewer women than men online from these households, an increase from the 46.5 million gap in 2017. The gender gap, as expected, is larger among the NHB who are older and rural residents. A significant gender gap continues to persist even among those who are younger (1.3 times more men than women are online in the 18–29 age group) and urban (1.4 times more men are online compared to women even in urban areas).

**We also observe significant gender gaps in digital engagement, especially when it comes to using digital technology for payments, work, or mobility.** On average, women spend 30 minutes less online each day than men—amounting to ~13,000 fewer hours or ~1.5 fewer years than men over a lifetime. Most women are concentrated in the “passive” user segment, and the share of NHB women who are power users or pathfinders is 0.85 times that of NHB men.<sup>46</sup> The gender gap is particularly stark for specific online activities, such as digital payments, mobility, and tools for work, as well as online gaming.<sup>47</sup>

**This gender gap in usage contributes to women realizing less positive impact from being online.** Engaging in a broader range of online activities (as power users and pathfinders do) is linked with deriving more impact from being online. This may partly explain why 1.3 times more men than women are “big winners” who report significant transformational gains from going online. Accordingly, wherever the gender gap in usage expands, especially in the case of the NHB who are young or rural residents, the gap in impact also follows.<sup>48</sup>

45 If the gender gap were to be calculated as GSMA does, the gap has diminished from 52% to 35% in lower-income households from 2017 to 2022 (when compared to a change from 68% to 40%, respectively, for all of India, according to GSMA).

46 Thirty-eight percent of women and 29.

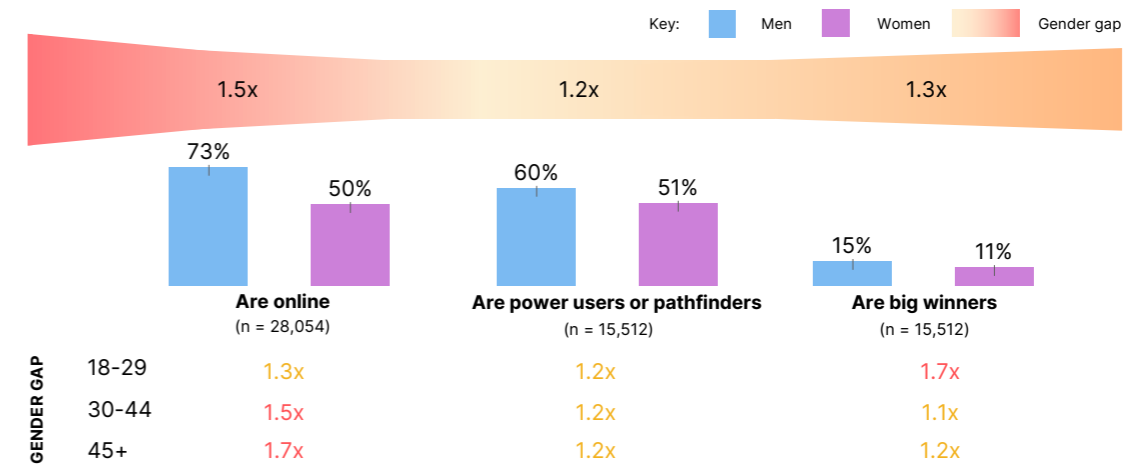
47 1.3 times more men use digital payments, and close to 1.2 times more men access transportation online, play online games, and use digital tools for their work compared to women.

48 1.2 times more rural men than women are power users or pathfinders. Similarly, 1.5 times more rural men are big winners compared to rural women. The gender gaps in both usage and impact are higher among young Indians (between the age of 18 and 29) than other age groups. 1.2 times more men in this age group compared to women are power users or pathfinders and 1.7 times more men are big winners.

Figure 10: Online gender gaps for online presence, usage, and impact

From left to right: % of low-income men and women who are online; % of men and women NHB who are power or pathfinder users; % of men and women NHB who are big winners

Age-wise breakdown shows how many more men than women fall under each category, measured as (% of men)/(% of women)



A slightly different trend in gender gap is observed across different age groups. While access gaps are smaller amongst younger respondents, their impact gaps are higher. On the flip side, access gaps are largest in the 45+ age group while their usage and impact gaps are smaller.

Source: Dalberg NHB listing survey, 2023 (n=28,054); Dalberg NHB main survey, 2023 (n=15,512)

**Online gender gaps are tied to several factors including lack of literacy and digital skills, low financial autonomy, and a gendered perception of online risks, which, when alleviated, can propel women to be power users and big winners.** Differences in digital engagement are only a part of the story. Regardless of the range of digital engagement, a gender gap remains: up to 1.7 times more NHB men than women derive positive impact from being online.<sup>49</sup> This gender gap in impact narrows only slightly with increased digital engagement among the younger NHB (18–29 years old) and does not seem to vary with digital engagement at all for rural members of the NHB.<sup>50</sup> This implies that factors beyond usage can influence the kind of impact that the NHB derive from being online.

The gender gap in access, usage, and impact, can be traced to a lack of literacy and digital skills, low financial autonomy, and a gendered perception of online risks.<sup>51</sup> A few women, supported by enablers like financial autonomy and personal incomes, are able to partially transcend the gender gap to become power users and big winners.<sup>52</sup>

**Similarly, restrictive (or favorable) gender norms can also contribute to the widening (or narrowing) of digital gender gaps.** Studies conducted in other low- and middle-income countries, such as Kenya and Nigeria, have demonstrated that social norms related to the perceived value of women versus men, their purpose and role in society, their agency, and their mobility have a

49 Even after controlling for usage, we see either a directional or significant gender gap in impact amounting to 1.1–1.7 times more men than women who are big winners across different usage segments except for passive users. Among passive users, 1.1 times more women than men report being big winners.

50 The overall gender gap in impact among the NHB aged 18–29 is 1.7 times; the gap shrinks to 1.5 times among power users and pathfinders in this age group. Among rural-dwelling members of the NHB, the overall gender gap in impact derived from being online is 1.5 times, which stays at 1.5 times among rural power users and pathfinders.

51 Approximately 2.2 times more NHB men than women have paid employment, and 1.6 times more men than women have full autonomy over any income they earn. 1.5 times more of the NHB (both men and women) believe it is risky for women to be online than believe it is risky for men. Additionally, even among the youngest age groups (15–29 years old), at least 25% fewer Indian women possess basic ICT competencies than men (National Sample Survey Office, 2023). From our data, we also know that 37% of rural NHB women have obtained either no education or only education below the 10th grade, compared to 31% of NHB overall.

52 Women who earn money or have full financial autonomy make up two-thirds of female power users compared to a third of passive users. Similarly, these women make up 63% of women big winners compared to 38% of those women who report no impact from being online. The gender gap in usage shrinks from 1.2 times to 1.1 times when comparing all men to women who are gainfully employed or financially autonomous. The gender gap in “big winners” actually flips—to 0.9 times—when comparing all men to this subset of gainfully employed / financially autonomous women.



bearing on women's digital inclusion. While men are often the ones controlling access at a household level, both men and women internalize these norms. For example, in India (and other South Asian countries), women often must seek permission from their parents, in-laws, or husbands to make decisions. In other studies, 15% of Indian women cited lack of family approval as a barrier to internet adoption compared to 9% of men.<sup>53</sup> Moreover, in 2022, only 82% of women who acquired a device and paid for it themselves chose the model themselves.<sup>54</sup> As a result, women in areas with higher baseline levels of gender equality, such as North-Eastern India,<sup>55</sup> face among the narrowest digital gender gaps across the country.<sup>56</sup>



■ **Stories behind our data.** . . . . .

*My eldest son is the only person who has a mobile phone in the house. My younger son is not interested, and we do not allow girls to use the phone or talk to outsiders. If they need something from the internet, my eldest son does it for them.*

Rajesh Kumar, security guard, Mumbai

**Technology companies that serve the NHB are missing out on the business opportunity of making products more relevant for women.** Only 1 in 2 enterprise survey respondents serving the NHB say that women are a future priority for them—despite a strong business case to engage with women actively and deliberately by addressing gendered barriers. ONI's study in 2022<sup>57</sup> found that women, when served well, can become strong proponents of providers—an especially meaningful finding in view of the NHB's reliance on word of mouth recommendations to adopt new apps.

📖 **Case study** . . . . .

**Pratilipi's deliberate efforts to better serve women yielded rich dividends for both user experience and the organization**

Pratilipi is a self-publishing platform with user-generated multi-episodic stories in over 10 local languages. In its early years, Pratilipi organically gained traction among women as both readers and writers on its platform. Recognizing this as an opportunity, Pratilipi started to think more deeply about how it could better serve women.

Through a mix of data-driven insights and direct feedback from users, Pratilipi identified key challenges faced by women on its platform and took deliberate steps to overcome them. This user-centric approach to serving women underpins why two-thirds of creators and more than half of readers on Pratilipi are women, compared to the 25–30% adoption rate usually observed on other platforms. Cultivating its user base has helped Pratilipi create a community of loyal women writers and readers; they contribute valuable IP, spend twice as much time on the platform as men, and make up a majority (60%) of the paid subscriber base.

53 GSMA, 2023b.

54 GSMA, 2023b.

55 While significant gaps in gender equality continue to persist in North-Eastern India as well, women in this region perform better across metrics of political participation, land ownership, and labor force participation than women the average Indian woman. (Dang, 2019)

56 1.3 times more men in North-Eastern India are online today compared to women. Similarly, only 1.1 times more men are pathfinders or power users and equal proportions of men and women are big winners. These gaps can be as great as 1.6 times, 1.3 times, and 2.1 times, respectively, in regions such as Central India.

57 (60 Decibels & ONI, 2023).

A few lessons from Pratilipi's experience that can be adopted by other technology firms to better serve women include:

- **Safeguard women's preferences for how and when they wish to engage:** A host of household and caregiving responsibilities prevented women from regularly uploading content on Pratilipi. Recognizing that family obligations might interfere with women's agency (i.e. in how and when they engage online), Pratilipi introduced features to help counter these constraints. For example, it introduced scheduled chapter releases and broadcast channels for female writers to create predictability and transparency in their audience engagement.
- **Promote women's anonymity and decision-making rights:** Women writers on Pratilipi were hesitant to take creative liberties for fear of being outed. To protect user's privacy, Pratilipi made most user profile fields optional and allowed writers to publish under a pseudonym. In some cases, family members even attempted to delete writers' Pratilipi accounts without their knowledge due to "their distraction from childcare responsibilities" and a "lack of trust in what they do online." The platform now attempts to reach out to and receive verbal consent from writers before de-activating their accounts.
- **Proactively take down hateful and inappropriate content:** Digital content produced by women often faces a sea of hate speech and harassment. Pratilipi has taken a proactive stance, leveraging both technology (machine learning algorithms) and human capacity (an active content moderation team) to foster feelings of trust, safety, and positivity on its platform. Pratilipi's built-in machine learning algorithm flags and takes down inappropriate or hateful speech with 98% accuracy. Moreover, reviews and comments with positive messaging get more visibility than negative ones. The platform's moderation team is highly active in reviewing flagged content and messages / comments received by users.
- **Invest in improving women's digital skills and confidence that are essential for deeper engagement:** Pratilipi offered the opportunity for women writers to earn from their work and for readers to contribute to authors of their liking. However, due to a lack of financial literacy, restrictive social norms, and limited experience with making (or receiving) financial transaction online, women writers on the platform were unable to take control of their income, and readers who wanted to contribute were also unable to do so. In response, Pratilipi prioritized improving women's financial literacy and confidence transacting online. For example, they conducted financial literacy workshops with writers that aimed not only to impart financial knowledge but also to prompt women to take greater ownership of their income. These workshops allowed some writers to open their first bank accounts and educate others in the community. Pratilipi also introduced user-centric guidance on the platform to de-mystify transacting online and teach users how to pay for the service either themselves or with the help of those around them (e.g., family members, friends, a nearby kirana store).

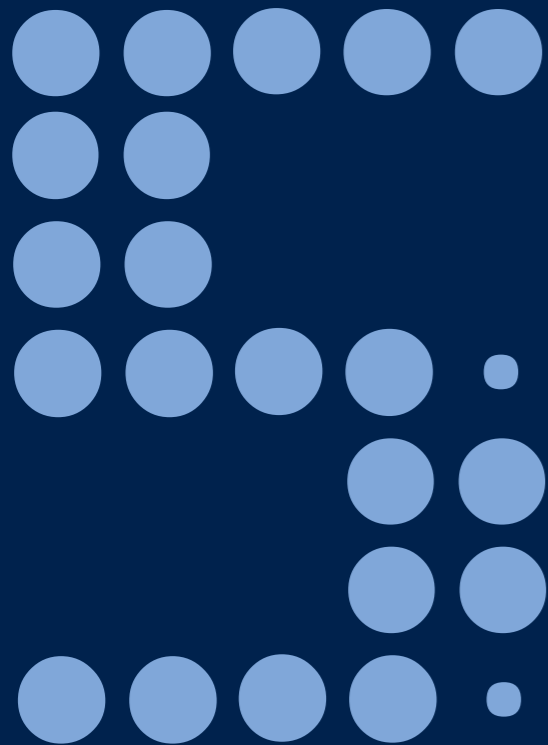
*"You'd be pleasantly surprised by the quality and depth of stories written by women on Pratilipi. They write about paranormal horror, superheroes, suspense thrillers, their desires, their moral quandaries, and much more. They may not have a lot of liberty at home but online they are wordsmiths of their own language.*

Shally Modi, Co-founder, Pratilipi

*"When I saw my first earning of Rs. 285 in my account, it brought tears to my eyes. I felt liberated. Every month, my growing income affirms that Pratilipi is not just a platform but a dear companion that has guided me to this new world of freedom."*

Woman writer on Pratilipi

# DIGITAL RISKS AND HARMS: THE CASE FOR A MORE COMPREHENSIVE APPROACH



## Chapter summary

Going online is risky for the NHB: harm is widespread, frequent, and affects the NHB's lives profoundly. They do not have adequate protection measures, and deep online engagement does not insulate them from harm—on the contrary, increased usage correlates with increased harm. Online harms also have a significant business cost: fear of harm presents a major barrier to adoption of online services and

can limit both engagement and willingness to pay. There is much industry and policy focus on data privacy and the high incidence of online fraud. However, this is a narrow view that neglects and leads to under-investment in other harms, such as reputational harm, harassment, negative self-image, and bullying, all of which also have serious consequences for the NHB.

**Going online is risky for the NHB; this presents a high business cost, as safety concerns prevent many of the NHB from trying out new online activities or limit their willingness to pay and the extent of their engagement.** Fifty-five percent of the NHB have experienced at least one of the online harms we studied.<sup>58</sup> Many of the NHB (23%) report that they have not adopted a digital service due to safety concerns—whether or not they personally have experienced online harm.<sup>59</sup> And some (6%) stopped using a digital service altogether due to safety concerns; half of this group have experienced severe negative impact from an online harm they faced.<sup>60</sup> Paying customers who had experienced online harm in the last year spent 39% less on digital services than those who had not.<sup>61</sup>

Safety concerns that limit NHB engagement are most pertinent for digital activities like consuming and creating content, commercial digital payments, and business services. Our HCD interviews also suggest that the perceived risk of being online may lead some people to see little relevance in going online by themselves, and instead encourage them to continue to rely on others for their more immediate internet needs.

58 We asked about cyber fraud and deception (fraud, downloading fake apps, untruthful online information), online abuse (harassment, including sexual harassment, and bullying), and psychological harm (reputational harm and negative self-image). Most studies, when categorizing and studying online harms, focus their narrative on how the harm was perpetrated or attempt to focus on the nature of the threat. In contrast, we sought to unpack the NHB's experience with and understanding of harms. We wanted to be expansive, even though we couldn't be fully comprehensive given the vast range of harms that people experience online. We chose to focus on those harms that were most relatable to the NHB and how those harms made the NHB feel. We therefore focused on three types of harms: fraud and deception, online abuse, and intra-personal psychological harms. This is similar to several studies that have categorized harms by the nature of their threat (sexual, financial, privacy related, etc.) (Amnesty, 2017; Andrey, 2023; Child Rights and You [CRY], 2020; Internet Society & NOAH, 2018; World Economic Forum, 2023), but different from others that classify harms based on how they are perpetrated (through conduct, contact, or content) (Livingstone & Stoilova, 2021; Ofcom, 2021; World Economic Forum, 2023).

59 Fifty-six percent of the group had not personally experienced a harm.

60 From our survey and HCD interviews we also observe that individuals who face multiple harms or experience severe impact from online harms more often report negative impact from being online (see Chapter 6- What is it all for: The impact of being online on NHB lives).

61 Among NHB customers who pay for digital services, those who have not experienced online harm in the last 12 months pay Rs 138 per month on average. Those who have experienced online harm pay an average of Rs 90 per month.

## Navigating the trust chasm in digital payments



Sakshi is a 20 year old Kabaddi player from Haryana. She has been online for the past 4 years and uses her mobile phone to regularly access workout related content online, register for competitions, and communicate with her friends. She often also helps other elderly users in her community use digital services like opting for govt schemes online. For the longest time however, Sakshi was hesitant to adopt digital payments given the complicated onboarding process and fear of losing money due to personal error or fraud. Only when a trusted older cousin encouraged her and offered to be by her side while she completed her KYC and tried out a few digital payments transactions, did Sakshi gain the trust required to start using digital payment services.

Share of NHB who experienced the harm  
% of NHB

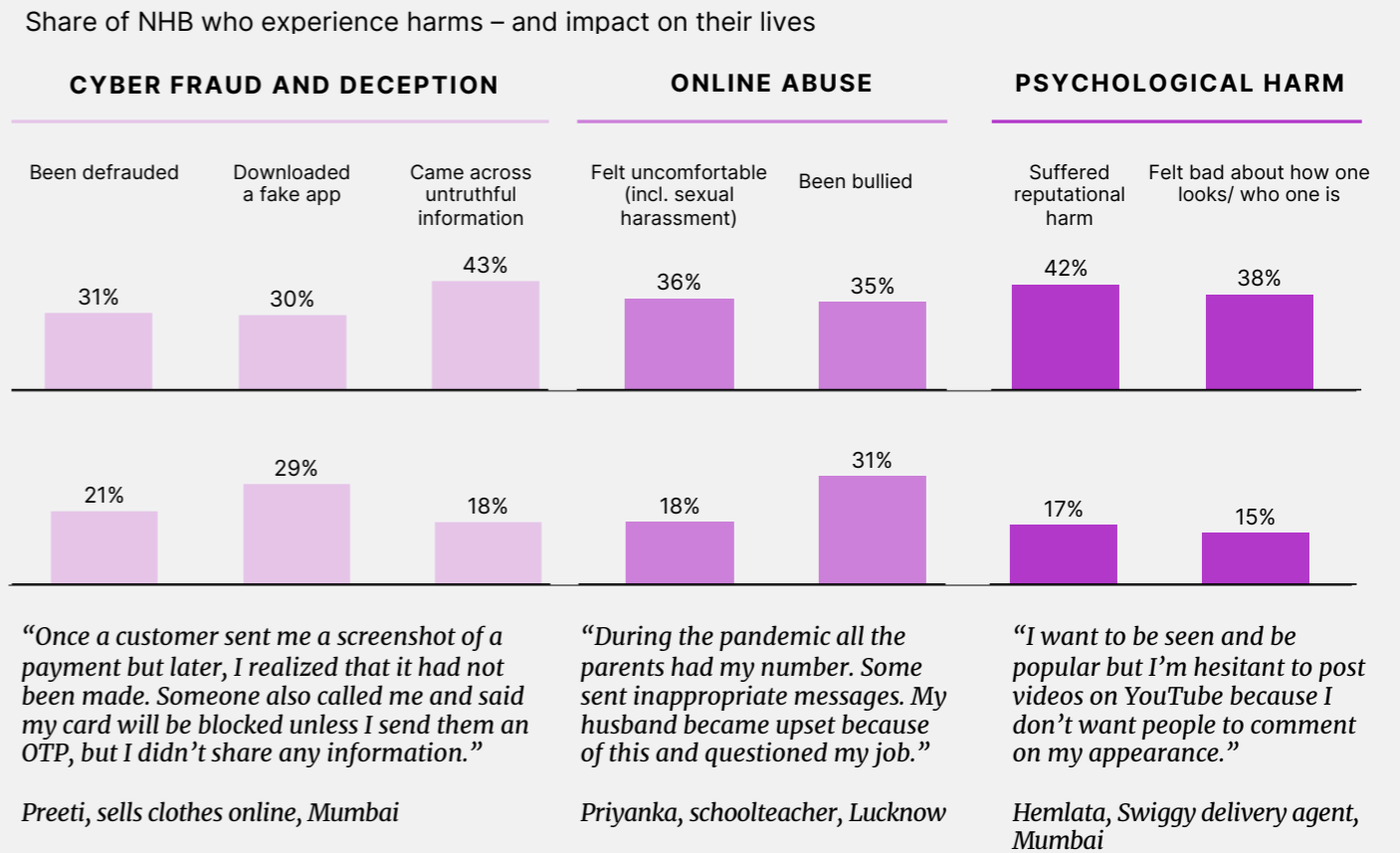
Share of NHB who face persistent negative impact from the harm  
% of those who experienced the harm

**The NHB’s exposure to cyber fraud and deception is frequent and consequential; technology providers are aware of the issue.** India ranks among the top five countries globally in terms of incidence of cyber crime:<sup>62</sup> 40% of Indian households report that they have been victims of online financial fraud in the past three years.<sup>63</sup> Similar to the overall Indian experience, 31% of the NHB report that they have been financially defrauded online in the past 12 months and 20% report being defrauded multiple times. The NHB’s experience of fraud further extends to being offered a fake job online (40%) and to downloading fake apps (30%). The impact of fraud is extremely consequential for the NHB given their limited financial resources: 24% of the NHB who have faced fraud lost an amount roughly equivalent to their average monthly expenditure on groceries<sup>64</sup> or more; 3% have lost Rs 12,000 or more (equivalent to the NHB’s entire average monthly household income). Many of the NHB report that experiencing fraud led to persistent negative impact: it has continuously interfered with their daily lives (8% of those who experienced it) or has required them to invest significant time and resources to overcome the after-effects (14%).

Two in five of the NHB also report that they have encountered false information online at least once over the past year, after which 21% faced persistent negative impact. When interacting with services or products, the NHB may encounter false marketing or fraudulent transactions (product or service quality being lower than promised, or transactions not being honored, etc.). It is unsurprising, then, that half of supply-side actors consider fraud and false information among top digital risks faced by the NHB.

62 FBI, 2021.  
63 LocalCircles, 2023.  
64 The bottom 50% of India by expenditure spends an average of Rs. 2144 on groceries per month (KANTAR, 2022).

**Figure 11: Share of NHB who have experienced various online harms in the past 12 months and share of those reporting persistent negative impact from these harms**



Source: Dalberg NHB Survey, 2023 (n = 15,512)

**The NHB’s exposure to online abuse (and psychological harm) is just as frequent and consequential; however, technology providers rarely prioritize it.** The NHB’s incidence of online abuse and psychological harm is similar to that of cyber fraud and deception. Approximately 35% of the NHB report facing online abuse (e.g., being bullied or sexually harassed online) in the past year, while ~40% report facing psychological harms (i.e., having a negative self-image due to being online or reporting that their reputation has been harmed online). The consequences of facing online abuse are, if anything, greater than those of cyber fraud: ~40% report that they experienced persistent negative impact. The consequences of facing psychological harm are somewhat less dire, yet far from trivial: 20–25% of those affected report persistent negative impact. Unlike fraud and deception, which supply-side actors believe to be threats to their core product and value proposition, online abuse and psychological harms are considered to be outside their ambit of control. This might explain why only 8–10% of firms serving the NHB consider online abuse and psychological harms to be top risks faced by the NHB.

**Most of the NHB, even the more advanced users, cannot adequately protect themselves and are unaware of the gaps in their digital safety.** Greater online experience or digital sophistication does not protect the NHB against harms. On the contrary, more intensive and sophisticated users are at greater risk—7 times as many power users as basic users experience all measured harms. Few of the NHB (31%) adopt preventative protection measures, and even those measures are often basic and insufficient to insulate the NHB from harm.<sup>65</sup> Meanwhile, many of the NHB are unaware of the inadequacy of their digital safety efforts and remain confident in their ability to protect themselves online.<sup>66</sup>

65 Close to 60% of the NHB adopt at most one protection measure to protect themselves on social media or financially, often only limited to basic measures such as not sharing personal information or restricting communication to known contacts.  
66 While confidence in one’s capability to protect oneself online is correlated with the number of protection measures taken, ~30% or more of the NHB feel completely confident in protecting themselves online despite not taking any measures to protect themselves either on social media, online financially, or from fake news

The NHB's experience of harms is likely to vary by their identity. Surprisingly, however, no meaningful differences emerge by gender in our survey (we explore this result further below).

### ★ Additional spotlight

## The need to unpack the identity-based experience of digital harms

Our data do not reveal an expected gap between men's and women's experience of digital harms.<sup>67</sup> Similar shares of men and women say they experienced each of the harms we studied. They also report being similarly impacted by such experiences.

We believe that this is due to two reasons:

1. As is the case with many surveys, it is likely that women are under-reporting their own experience with harms, despite our efforts to create a safe space during the interview. For example, they may fear that family member will restrict their internet access if they learn of incidents, or they may feel uncomfortable speaking about harassment. That said, men may also under-report harassment and other harms.
2. How women and men experience and contextualize digital harms against the backdrop of their lives may differ greatly. Women are more likely to face instances of physical and psychological abuse in their offline lives and therefore may not always "see" their online experiences as abusive, exploitative, or harmful in nature. On the other hand, men, in their perceived role as the head of the family, may conflate their families' experience of harms with their own.

Our study does, however, show that transgender individuals face almost all types of harms far more than others, and they are also more severely impacted.<sup>68</sup> While we do not fully understand the unique and diverse experiences of LGBTQIA+ members of the NHB, what is clear from our study is that we need a far deeper understanding of how identity—including, but not limited to, gender and sexual identity—impacts people's experience of online harms in order to design solutions that reflect the full range of their lived experiences.

### 📄 Case study

## The experience of a few enterprising frontrunners showcases how the NHB's digital safety can be prioritized and realized

### Vedantu's campaign against online child abuse:

**Context:** Vedantu, an Indian ed-tech player, became the first Indian platform of its kind to adopt a zero-tolerance policy for child bullying and abuse online. Realizing that its mission of creating an optimal learning environment for children required the assurance of children's online safety, Vedantu partnered with Space2Grow, a niche social impact consulting firm specializing in child protection, to create a digital harms prevention and redressal mechanism across all online and offline touch points.

<sup>67</sup> Recent literature on harms experienced on the internet shows that women experience harm at a higher rate and with greater severity (Amnesty, 2017; GSMA, 2023b; Internet Society & NOAH, 2018).

<sup>68</sup> Thirty-three percent of the NHB who are transgender face all harms studied, compared to 24% of men and 23% of women. Similarly, 34% of transgender respondents who face any harm report experiencing persistent negative impact, compared to 26% of men and 25% of women.

**Efforts underway:** Vedantu began by building internal consensus on the importance of child safety to its mission. It was able to ensure that 100% of its teachers and 75–80% of the children and partners it works with are knowledgeable about child safety (versus an industry standard of 25–35%). Going beyond awareness, it also developed tools and processes to prevent (or redress appropriately) instances of harm. These include introduction of a profanity filter on the Vedantu platform; providing a "support button" for students and teachers to report any mishaps; employing a team of childcare experts to provide necessary redressal, investigation, and adjustment support to students, teachers, and parents involved; and transparently disclosing the number of reported safety concerns, alongside periodic updates on the status of complaints and measures taken to resolve them.

**Impact and way forward:** These efforts have contributed to Vedantu's distinct value proposition as a safe place for young people to learn. Recently, Vedantu and Space2Grow launched an Online Child Safety Benchmarking Framework for ed-tech firms. Such a framework can offer a starting point (and a template) for technology providers, government, and civil society members to work together to safeguard users against a broader range of digital harms.

### Doosra's efforts to safeguard digital identity:

**Context:** Unsolicited calls and messages are a common source of harassment and fraud for the NHB. Due to the absence of dedicated legislature around data protection, consumers' phone numbers (which are freely shared on a number of online applications) are susceptible to misuse. Doosra is a start-up that provides users with a SIM-free virtual mobile number that consumers can use as a secondary digital identity to safeguard their privacy.

**Efforts underway:** To date, Doosra has processed more than 2.7 million unwanted calls and 7.6 million unwanted messages and has empowered its 15,000 active users with greater control over their digital interactions.

*"[Doosra] helps you protect your primary number. [Their] virtual number lets you choose who can call back, who can't."*

Quote from a user of Doosra

Most of Doosra's users today tend to be educated, urban dwelling and middle-to-high-income individuals with a high degree of digital awareness. While this is to be expected, a solution like Doosra holds a lot of potential for making digital services safer, especially for those who are less digitally aware.

**Way forward:** Technology companies can partner with solution providers like Doosra to add an extra layer of security to their product, distinguishing their offering from others. For more high-risk use cases, and where the government plays a direct role in digital infrastructure development (such as digital payments through UPI), the technology is available to establish these security measures as standard practice.

### LOOKING AHEAD → →

The NHB's experience of harms is clearly diverse, consequential (both to their personal lives and to the businesses serving them), and more layered than previously believed. Investing further in understanding these harms and appropriately safeguarding the NHB against them will be key to placing people's needs at the center of the online experience.

# WHAT IS IT ALL FOR: THE IMPACT OF BEING ONLINE ON NHB LIVES

## Chapter summary

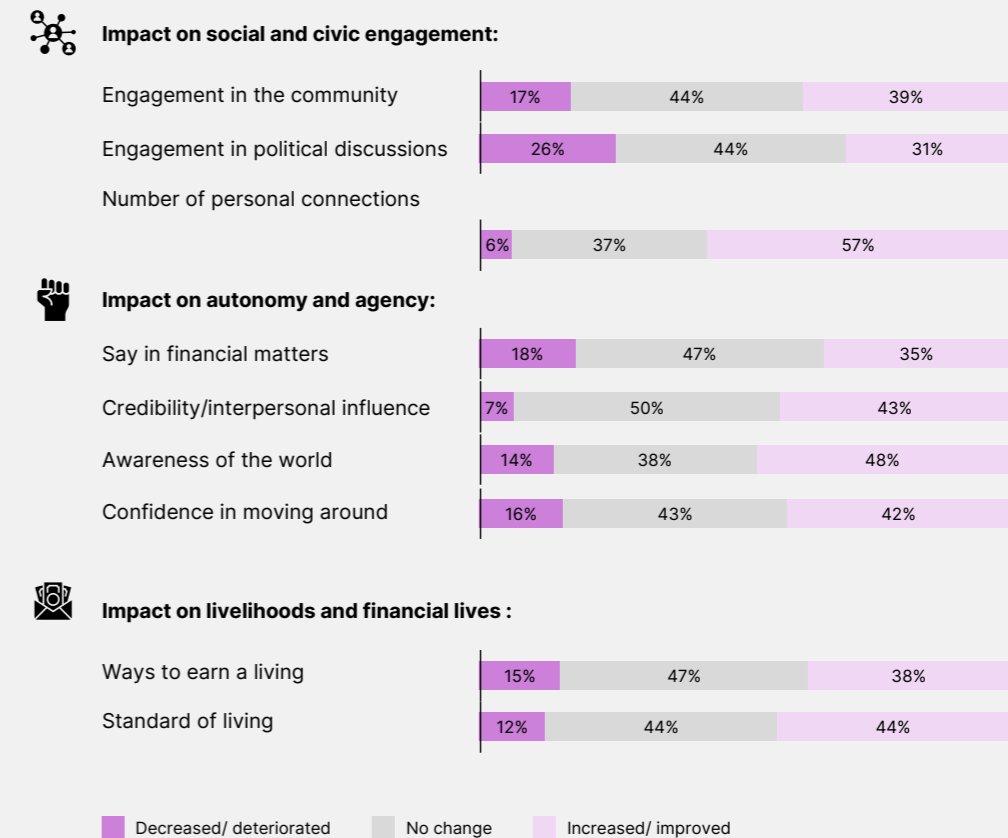
Going online has had diverse impacts on the NHB. More than 36 million are “big winners”—members of the NHB (often power users) who report that they have greater agency, are more socially connected, and experience greater financial opportunity because they are online. But going online is no guarantee of an improved life: two in five of the NHB report no impact from going online, and one in eight, despite typically being power users, attribute a

decrease in their overall quality of life to their digital engagement. Being online is also not an automatic leveler of entrenched inequity in society. Positive impacts disproportionately accrue to men, entrepreneurs, and people who already have a high level of financial autonomy. Women and transgender people disproportionately report no impact and negative impact, respectively.

**The impacts of going online are as varied as one would expect.**<sup>69</sup> A similar share of the NHB report that being online has had little to no overall impact on their lives (45%) as report that being online has had an overall positive impact (42%); some (12%) believe that digital has, in fact, negatively affected their lives. But these overall numbers hide some important nuances—about who is winning and who isn’t, what is working and what isn’t, and where concentrated efforts are needed to help ensure that India’s digital evolution is driving positive impact that is significant, equitable, and growing.

**Figure 12: Impact of going online on various aspects of NHB life**

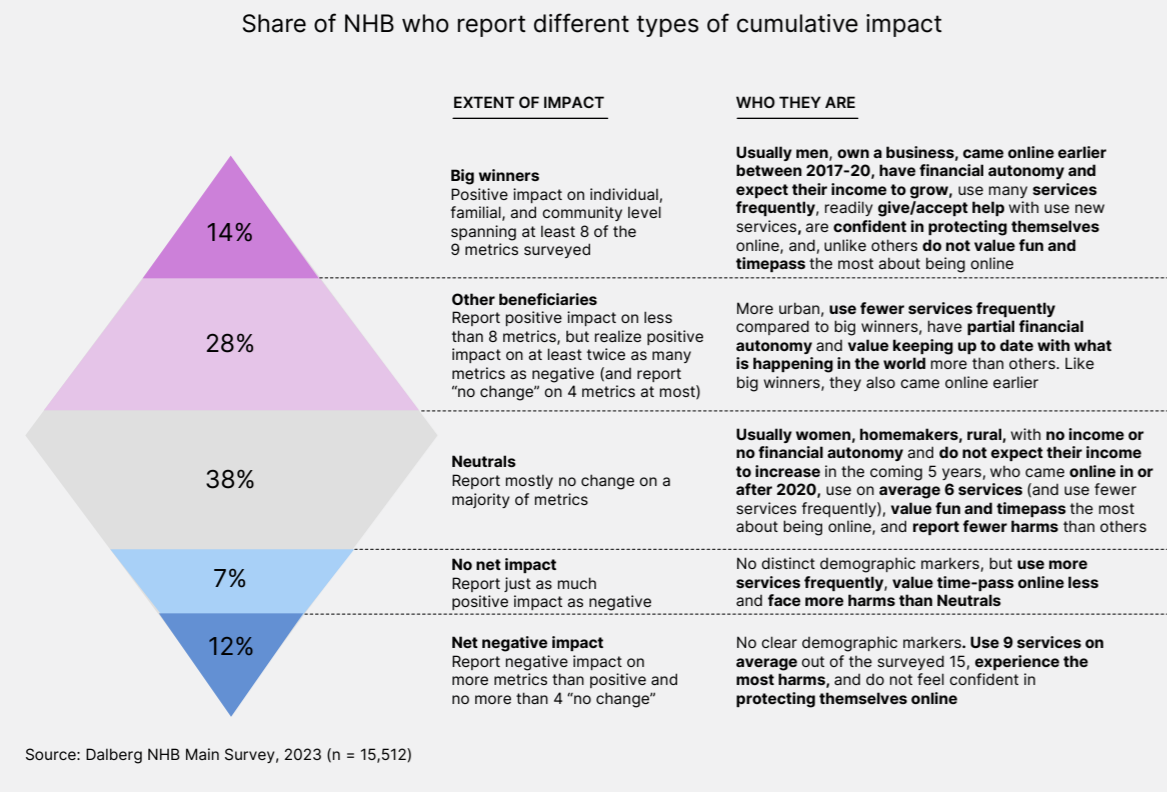
Share of NHB who report positive, neutral, or negative impact



Source: Dalberg NHB main survey, 2023 (n = 15,512)

<sup>69</sup> Given that many NHB in our study started going online around the time when Covid-19 pandemic struck, it is possible that their assessment of impact of going online on their lives has been influenced by their experience of the pandemic. In this study, we were unable to delineate the influence of this on NHB responses.

Figure 13: NHB segments by how impact of going online stack up on the 9 dimensions surveyed



First, and most encouragingly, a sizable minority—14% of the NHB, or nearly 37 million individuals—believe that digital has had a transformative, positive impact on their lives. We assessed impact of going online over nine key metrics across three categories (social and civic engagement, mobility and agency, and livelihoods and financial lives)<sup>70</sup> in our survey. The “big winners” experienced transformative impact, defined as positive change across nearly every outcome. Enabled by digital, the big winners are more aware of happenings around world (locally, nationally, and internationally) and have expanded their personal networks and spheres of influence; they have increased the ways in which they can earn a living—more than twice as often as the NHB overall, they are platform gig workers or paid online influencers, or have found a new job online or with the help of skills learned online—and have improved their standard of living.<sup>71</sup> Given their increased knowledge, exposure, success, and influence, they are also often seen as go-to resources by others in their community—72% of big winners offer to help others when using new apps or services, whereas only 40% of other members of the NHB do the same. Going online is even allowing a significant share of disabled members of the NHB to reap transformative positive impact: members of the NHB with disabilities are big winners 1.5 times as often as others.<sup>72</sup>

70 **Social and civic engagement:** engagement in the community, engagement in political discussions, number of personal connections. **Mobility and agency:** say in financial matters, credibility / interpersonal influence, awareness of the world, confidence in moving around. **Livelihoods and financial lives:** ways to earn a living, standard of living. We chose these metrics based on existing evidence and hypotheses in the literature around (potential) positive and negative impacts of digital engagement, and for their ease of implementation through a survey. They are, of course, not the only possible areas of impact. And, as with all simple metrics, they are limited in how comprehensively they can capture the underlying constructs.

71 Nineteen percent of big winners are platform gig workers compared to 7% of the rest of the NHB; 19% of big winners are paid content creators compared to 7% of other members of the NHB; 39% of big winners have found jobs through online job search or skilling compared to 18% of other members of the NHB.

72 The NHB with disabilities among our respondents may be financially better off than other NHB. Seventy-five percent of them have some financial autonomy (vs. 67% of all other NHB), 20% of them have their own enterprise (vs 14% of other NHB). They are also more urban than other NHB (44% vs. 35%). Less well-off members of the NHB with disabilities may not have been able or willing to participate in our interviews – or less well-off people with disabilities may not be online at all. It is not clear that those who are less well off would reap the same benefits as those whom we interviewed.

Figure 14: Who are the big winners?



Source: Dalberg NHB main survey, 2023 (n = 15,512)

NHB entrepreneurs (including nanopreneurs) are big winners or other beneficiaries nearly 1.25 times as often as other members of the NHB. Much of this is driven by an expected edge when it comes to livelihood and financial impacts: most NHB entrepreneurs<sup>73</sup> who use digital tools report increased business earnings (50%), smoother operations (53%), and an improved standard of living (53% vs. 43% for other NHB members) attributable to going online. Interestingly, much of the disproportionate increase is driven by flexible, creative uses of technology. For example, a boutique owner may use YouTube to look up trending designs or pay for Instagram ads when she has a particularly interesting new design to sell.

**Beyond the big winners, a further 100 million of the NHB believe that digital has made their lives better overall.** These are individuals who have seen some clear improvements across multiple dimensions, most commonly mobility, awareness, and personal connection. When we consider this group together with the big winners, roughly three times as many of the NHB report a net positive impact than report a net negative impact of digital.

73 We define NHB entrepreneurs as those who run their own business. Their businesses may be either their main source of income or an additional source of income alongside their main source.

## Livelihood benefits of going online

Going online was always expected to connect people; whether it can enable people to achieve personal financial and productivity gains, however, has been hotly disputed. This study has identified several ways in which NHB livelihoods can benefit from digital (although we do not have data on the size of these gains<sup>74</sup>).

**Digital tools underpin the livelihoods of many of the NHB.** One in three of the NHB use digital tools for their work, usually to prepare for work, advertise for work online, or to take payments (the latter particularly for members of the NHB who run their own business).

**A small share of the NHB have digital-first jobs:** 5% work through gig platforms and 2% have jobs that are fully online (e.g., online marketing or data entry). These digital-first NHB workers are mostly urban, relatively early adopters of the internet (between 2017–2020), and have greater financial autonomy.

**A sizeable share of the NHB also use digital services to improve their livelihoods; most of the benefits accrue to the already more privileged among the NHB.** One-third of the NHB have searched for jobs or learned new skills online. Almost half of them subsequently found a job they deemed to be better: more flexible (58%), better suited to their needs (42%), or—more rarely—better paying (12%). A greater proportion of the NHB who are men, are literate, and have been online longer use digital livelihood services and realize benefits from them.

**In total, 41% of the NHB report that their standard of living has improved due to going online.**



74 Our NHB survey attempted to unpack several dimensions of the digital lives of Next Half Billion users; the impact of going online was one among many. Evaluating the magnitude of this impact experienced by each individual would—at a minimum—require more time and detailed, focused lines of questioning for which there was not enough space in our questionnaires. Ideally, a study to assess the magnitude of impact would consider observed data to complement the self-reported data, which would require a completely different research design.

## The immense impact of digital on the lives of some in the NHB

Om Prakash started his business 12 years ago as a photocopier; today, his shop is a cornerstone of the village, providing a host of digital solutions. These include money transfer, cash deposit and withdrawal, creation of bank accounts, services like phone recharge or ticket booking, and e-governance services such as applying for a ration card and caste certificate. Om Prakash relies on the internet to operate almost his entire business. He believes being online has significantly increased and stabilized his income by helping him meet evolving customer needs efficiently. He prides himself on being able to provide essential services to the residents of his village and believes they view him with respect due to his knowledge of online services. He also feels that the internet has had a positive impact on public administration in his village, as complaints registered online receive more satisfactory and prompt resolutions.

*“My entire income is dependent on digital. If [the internet] was not there it would have become very difficult for me to earn and there would have been a big difference in my income.”*

Om Prakash, 28, graduate, runs a village service center, Masira

**However, nearly half of the NHB also report no change in their lives due to going online.** Two in five—many of them homemakers<sup>75</sup> report no meaningful change across our nine impact dimensions. This may be because some of them have only recently come online: 1.3 times as many of the NHB who came online in 2020 or later report no life impact from coming online as do those who came online earlier. Newer users may not yet have experienced some of the major benefits that come with deeper engagement (e.g., accessing more varied livelihood opportunities). Many (44%) in this “neutral” group are passive users—they use the internet largely to stay connected and for entertainment.

**What is more concerning is that 43 million of the NHB experienced net negative impact across our studied dimensions; the common thread across this group is that they were much likelier to have faced multiple online harms.** Two in three of those negatively impacted have faced at least one harm, and nearly half have experienced all seven of our measured harms, compared with 21% for other groups. Less than a quarter are confident of protecting themselves online. This is especially true for transgender members of the NHB, who face a lot of online harms.<sup>76</sup>

**Surprisingly, there are no other clear demographic, occupational, or regional predictors of who is likely to experience net negative impact.** Men and women, salaried workers, contract workers, and business workers—all are equally likely to report experiencing more regression than progression across our quality-of-life dimensions. Perhaps most surprisingly, those who experience net negative impact are more likely to be power users than are the neutrals or even those who experienced net positive impact (net negatives are 1.4 times more likely to be power users than the other groups combined). Net negatives use an average of nine services (vs. six for neutrals and eight for net positives), and spend 230 minutes online daily (vs. 205–210 minutes for neutrals and net positives). Clearly, simply doing more online is not a sufficient condition for success. At the same time, more needs to be done to protect those who are newly online—too many are currently experiencing net negative impact.

75 Twenty-four percent of the NHB who report no change in their lives from going online are homemakers, while homemakers constitute just 21% of the overall NHB population.

76 Twice as many of the NHB who are transgender face net negative impact from going online compared to others. Thirty-four percent of transgender respondents also faced all of the surveyed online harms in the past 12 months compared to ~24% of others.

## How severely negative encounters can tip over to an overall negative digital experience

After a string of multiple negative encounters online, which culminated in financial loss and extreme psychological distress, one respondent sees very little positive value stemming from the internet and believes it has had a net negative impact on his life. He believes Instagram fueled a tiff in his family that damaged his reputation. He also reports being defrauded of Rs 5000 by someone who asked him for cash in exchange for a Paytm transfer that he never received. Prior to these experiences, he frequently used WhatsApp, Paytm, and other apps, but since has almost completely stopped going online. He has also come to believe that the internet has hampered his children's education and health by exposing them to violent or inappropriate content, and has reduced his standard of living by enabling impulse purchases

*“Going online has only led to ruin. It has caused my family to split up. For days I couldn't sleep and was ridden with negative thoughts. It has wasted my money. Now my kids don't study; they are always on their phone and don't even bother to talk to me when we're together.”*

42-year-old male HCD respondent

### LOOKING AHEAD → →

The majority of the NHB do not believe they are benefitting from digital. Given how significant some of the benefits of being online can be, it is critical to better understand what drives some people to become early adopters, confidently engage online and comfortably try out new products and features. Greater impact can only be achieved if we develop products and services that genuinely benefit the NHB and if we keep them safe as they deepen their online engagement. There is also a need to deeply understand what is happening across the income spectrum (within the NHB). Are only the relatively wealthy benefitting from digital? Is digital helping narrow inequality, or is it further widening it if, e.g., only the relatively well-off are willing to explore online.

# Digital gains and risks among traditionally excluded groups: Transgender NHB and NHB with disabilities

**Transgender members of the NHB<sup>77</sup> use a wider variety of digital services (including paid services) than cisgender members do. However, they face more digital harms, and many more of them report net negative impact from being online.** Transgender individuals—despite their overall lower levels of education and phone ownership<sup>78</sup>—engage with the internet more deeply than do their cisgender counterparts. They spend 1.1–1.3 times as many minutes online as cisgender men and women respectively, are 1.7 times as likely to be power users (especially using digital health, e-commerce, and public services), and are 1.5 times as likely to use paid digital services. Use of voice features may be driving their higher levels of digital engagement. However, their deep digital engagement also exposes them to risks. Transgender NHB members are 1.4 times more likely to have experienced all harms surveyed than are other members of the NHB, and they report especially high rates of fraud and online abuse.<sup>79</sup> Consequently, transgender members of NHB accrue more negative impact and less positive impact than do their cisgender counterparts. One in four of them report a net negative impact from being online—twice the share of cisgender NHB members who report net negative impact.<sup>80</sup>

**An even larger share of the NHB with disabilities<sup>81</sup> are power users, big winners, and use paid digital services (compared to other NHB members). Despite a high burden of harms, their overall positive and negative impact from being online is comparable to that of the rest of the NHB.** NHB members who have a disability are ~15% less likely to own a phone with internet connection, and 10% less likely to go online several times a week, compared to other members of the NHB. Yet, half of them (1.7 times the proportion of other NHB members) are power users who use digital tools for a broad variety of activities.<sup>82,83,84</sup> At the same time, the NHB with disabilities are three times as likely to have faced all of the surveyed harms, and even more likely to have experienced online fraud, in particular. Consequently, even as one in five of the NHB with disabilities (1.5 times the proportion of other NHB members) gain life-transforming benefits from being online, they are (1.2 times) as likely as the rest of the NHB to experience either a net positive or negative impact from being online.

77 Transgender members of NHB were purposively sampled as a part of our booster sample (N=250).

78 Transgender members of NHB are ~50% less likely to be educated above grade 10 and ~15% less likely to own a phone with internet connection as their cisgender counterparts.

79 Transgender NHB experience online fraud and abuse 1.35–1.45 times more frequently than cisgender members of the NHB.

80 One in four transgender members of the NHB also report a net positive impact from being online, compared to 42% of cis-gendered NHB members.

81 The NHB with disabilities among our respondents may be financially better off than other NHB. Seventy-five percent of them have some financial autonomy (vs. 67% of all other NHB), 20% of them have their own enterprise (vs 14% of other NHB). They are also more urban than other NHB (44% vs. 35%). Less well-off members of the NHB with disabilities may not have been able or willing to participate in our interviews – or less well-off people with disabilities may not be online at all.

82 A greater proportion of the NHB with disabilities undertake almost all of the surveyed activities, except communication, social media, and online entertainment, which they use at comparable levels to other members of the NHB.

83 Seventy-two percent of NHB with disabilities pay for any digital service compared to 52% of others.

84 Except communication, social media, and online entertainment, which they use at comparable levels to the rest of the NHB.



# NHB entrepreneurs

## Summary

NHB entrepreneurs are especially extensive adopters of digital tools, for which a large share of them pay. They report greater earnings and smoother business operations from using digital tools than do other digitally enabled workers. NHB women entrepreneurs, in particular, defy the trend observed among NHB women in general to emerge as winners from using digital business tools. However, addressing barriers related to unreliable internet connectivity, lack of perceived utility, safety concerns, low awareness regarding the right tools, and high cost of services can help increase adoption by non-users (more likely to be rural and less educated / literate entrepreneurs) and create greater value for current users.



**Many NHB entrepreneurs, across age groups and sectors, adopt and pay for digital business tools.** Roughly half of NHB entrepreneurs (and at least one-third in each age group and sector) use digital tools to run their business—most commonly digital payments and advertising.<sup>85</sup> The NHB value the ability of these tools to help them reach new customers easily and reduce operational costs.<sup>86</sup> Fifty-five percent of digitally enabled business owners even pay for such services. Alongside these paid tools, NHB entrepreneurs also make creative use of free tools like WhatsApp, Facebook, and Instagram for marketing, gathering information, and sourcing supplies.

**NHB entrepreneurs, especially extensive users who pay for digital business tools, benefit significantly more from being online than do other digital workers.** More than half of NHB entrepreneurs who use digital tools or payments for their business report that doing so has increased their earnings and made their business run more smoothly.<sup>87</sup> These gains are higher among entrepreneurs who pay for digital services and those who engage in more than half of the online activities that we studied.<sup>88</sup> By contrast, only one-third of all digital workers (and 27% of platform gig workers) report an increase in earnings from the use of online tools. Other studies have also found that adoption of digital tools by entrepreneurs (micro, small, and medium-sized enterprises—MSMEs) can help them grow their profits twice as fast as their offline counterparts and can increase their productivity by up to 20%.<sup>89,90</sup>

85 Fifty-two percent of all NHB entrepreneurs use digital payments for their business, 28% use online ads (17% pay for them), 20% use an e-commerce platform, 21% use an online delivery or logistics system, 18% use an ERP service (2% pay for it), 17% take assistance online for bureaucratic systems (1% pay for this), and 17% use a CRM portal (4% pay for it).

86 Compared to offline options, 41% of digitally enabled MSMEs say digital tools help them reach a wider range of customers easily, 34% say they help them reduce operational costs, 34% say they help them buy cheaper supplies, and 32% say they help them remain competitive.

87 Sixty-two percent of NHB entrepreneurs who use digital tools for their business say doing so has improved their earnings, and 60% say digital tools have made their operations run more smoothly. Similarly, 58% of NHB entrepreneurs who use digital payments say this service has increased their earnings and 61% say it makes their business run more smoothly.

88 1.8x more paying users of digital tools for businesses report an increase in their earnings compared to non-payers and 1.4x more report an increase in their operational efficiency. Similarly, 1.4x more MSMEs who use more than half of the surveyed digital business tools report an increase in income and operational efficiency due to using these tools, compared to those who used only half or less.

89 NASSCOM & ProHance, 2023.

90 KPMG & Google, 2017.

**Contrary to the general NHB trend, women entrepreneurs are equally extensive adopters of digital business tools and reap similar benefits as men.** Similar shares of men and women business owners use and pay for digital business tools. This includes the use of digital payments for their business—despite the fact that the widest gender gap in digital tool use is for personal digital payments.<sup>91</sup> Men and women also report similar levels of positive impact on their earnings and operations. Even among non-users, men and women express similar levels of interest in adopting digital tools for their businesses.<sup>92</sup>

**However, use of digital tools is lower among rural entrepreneurs and those with lower levels of education / literacy.** More entrepreneurs (1.4 times as many) from urban areas adopt digital business tools than do their rural counterparts. This gap widens when we look at English literacy and education: 1.5 times more entrepreneurs with above 10<sup>th</sup> grade education and 1.8 times more entrepreneurs who can read or write in English easily use digital tools for business, compared to their less educated and less English-literate counterparts.<sup>93</sup> However, once rural and less educated or less English-literate entrepreneurs overcome the adoption barrier, they pay for services just as often as other NHB entrepreneurs.<sup>94</sup>

**Addressing the barriers that prevent NHB entrepreneurs from adopting digital business tools is essential to increasing productivity.** One in three non-adopters of digital business tools would like to use them. Top barriers to digital business tool adoption are slow or unreliable internet, low relevance, and high cost.<sup>95</sup> In the case of commercial digital payments, safety concerns and difficulty of use also play a key role.<sup>96</sup> Entrepreneurs' safety concerns are well founded: 53% of businesses that use digital payments have been defrauded by customers, most of them repeatedly. Addressing these barriers to adoption has the additional benefit of helping to improve the experience of current users.<sup>97</sup>

91 Fifty-six percent of women and 51% of men entrepreneurs use digital tools to run their business. Similarly, 57% of women and 54% of men pay for such tools. While 1.3 times more NHB men (58%) overall use digital payments than women (44%), the gender gap closes among NHB entrepreneurs when considering use of digital payments for their businesses.

92 Around half each of MSMEs run by men (48%) and women (55%) report an increase in their income due to the use of digital tools. Fifty-two percent of women entrepreneurs also report smoother operations compared to 54% of men. Among the entrepreneurs who do not use digital tools to run their business, 15% of women and 19% of men express interest in using them.

93 Forty-six percent of rural MSMEs adopt digital tools to run their business compared to 64% of urban MSMEs. Similarly, 38% of business owners with less than a 10th grade education adopt digital tools compared to 58% of those with higher education. Finally, 51% of business owners who cannot read or write easily in English adopt digital tools compared to 57% of those who can read and write in English easily. This proportion falls to 31% among those who cannot read and write in English at all.

94 Fifty-four percent of digitally enabled MSMEs in rural areas and 56% in urban areas pay for digital business tools. Similarly, 53% of NHB entrepreneurs who use digital business tools and have less than a 10th grade education pay for these compared to 56% of their more educated counterparts. Finally, 54% of NHB entrepreneurs who use digital business tools and can read and write in English pay for these compared to 45% of their less literate (in English) counterparts.

95 Among non-users of digital business tools who say they want to start using these, 24% are held back by slow / unreliable internet connections, 30% by a lack of relevance, and 15% by the high cost of these services.

96 One in four MSMEs who do not (but want to) use commercial digital payments say they are held back by concerns regarding fraud and by difficulty in using such apps.

97 Among NHB entrepreneurs who use digital business tools, 20% face challenges related to lack of safety, 23% face challenges related to slow or unreliable internet connections, and 19% lack awareness of the right tools to use.

Stories behind our data

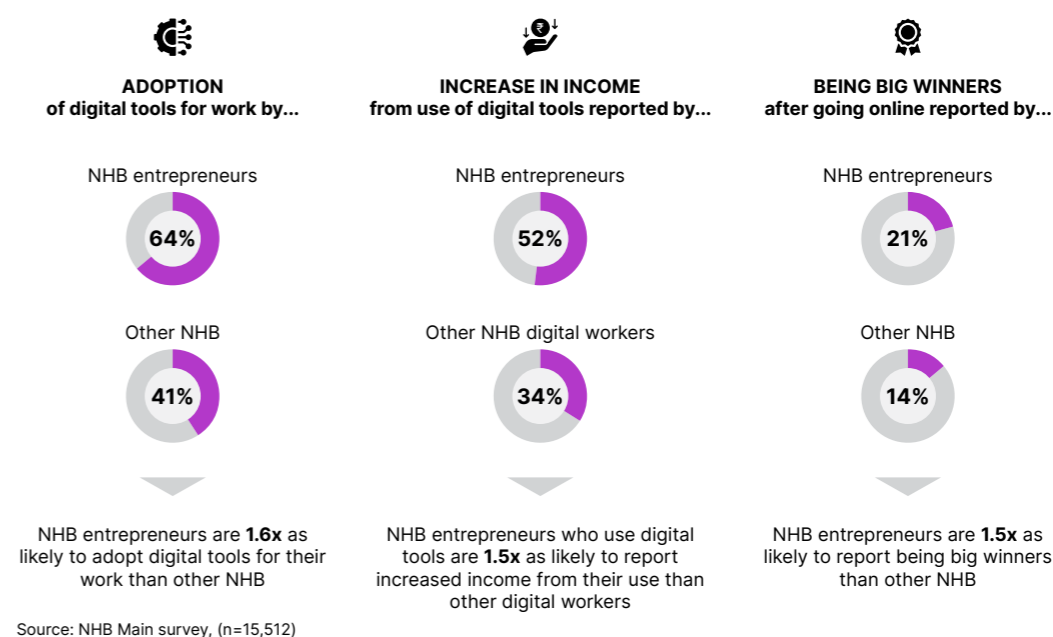
### Growing reach of digitally enabled women homepreneurs

Preeti, a high school graduate living with her husband and in-laws, who relies on a smartphone which she first started using 2018, to run her western clothing re-sale business from home. She runs a truly digitally enabled business operation, just using her phone - Meesho, Instagram and WhatsApp help her connect with buyers and sellers through a mix of text, photo and voice note features; GPay enables her to pay for and accept payments; and ShipRocket helps her make deliveries.

Coming from a family that does not want her going out for work, Preeti values the time-savings and convenience that the internet and smartphone can offer her. Keen to continue strengthening her business, Preeti regularly watches YouTube tutorials to discover newer apps and features relevant for her operations. However, she remains wary of losing her privacy and facing digital fraud and hopes that e-commerce and app stores display more quality indicators so she can make informed decisions.

*“I buy clothes on WhatsApp from wholesalers that I found on Meesho and resell them on Instagram and WhatsApp. Shiprocket or WeFast help me deliver these items and I accept payments through G-Pay, PayTM or PhonePe, but G-pay is my favorite.”*  
**Preeti, resale business owner, Mumbai**

Figure 15: Comparison of adoption, payment, and impact from digital tools among NHB entrepreneurs and other members of NHB<sup>98</sup>



98 In addition to asking digitally enabled NHB business owners, we asked the question of whether or not the use of digital tools for work has led to an increase in income to any member of the NHB who used digital tools for work and whose primary or secondary occupation was salaried work, contract work, casual work, self-employment, or unpaid work supporting a family business.

# DESIGNING FOR THE NHB: WHAT WORKS?

## Chapter summary

Innovations in the last five years, such as data pricing, feature phone capabilities, and design updates (e.g., increasing availability of local languages and voice-based apps), have helped the NHB increase their online engagement by improving affordability, reducing literacy barriers, and making digital interfaces more familiar to the NHB's lived reality. However, relevance, user experience, and affordability barriers

remain that make it difficult for the NHB to discover and start using new apps and services. Simplified app download and installation pathways, demonstrations and guided usage, micro-payment models, greater in-app privacy and user controls, and more responsive voice / language features are key to deepening the NHB's online engagement.

**In recent years, the tech ecosystem has made great efforts to overcome what were understood to be the largest barriers to NHB's digital experience: affordability gaps, low literacy, and unfamiliar design.**<sup>99</sup> Technology providers raced to unlock the market opportunity presented by the NHB, and communities of practice emerged to serve them. Handset innovations (e.g., Jiophone, which launched in 2017), coupled with increasing availability of cheaper data,<sup>100</sup> meant that even affordable feature phones could be used to go online. Simultaneously, app developers began designing for a hassle-free, smooth experience for the NHB by providing local language apps and content, integrating voice features, aligning user interfaces with the NHB's lived experience and preferences, and creating workarounds for the technical limitations of affordable phones (e.g., low RAM).<sup>101</sup>

**These efforts—especially around language and voice use—alongside the NHB's own creative and enterprising approach online, are helping the NHB overcome common constraints.** A large share of the NHB (46%) are not confident reading and/or writing in English; 14% are not confident reading and/or writing in their own language. Nevertheless, they are creatively engaging with apps and devices to overcome barriers: they ask friends and family for advice on which apps to download (56%) and they seek and provide help when using them (69%); they memorize interfaces and key words in English; and the majority of the NHB already use voice search, voice notes, and voice commands extensively (72% of the NHB use voice features, and over 1 in 3 of them prefer voice over typing). A very large proportion, 1 in 2, report using at least some apps in non-English (native) languages.

<sup>99</sup> This chapter relies mostly on our qualitative research: ~30 HCD interviews with people from the NHB and 20+ industry and expert interviews.

<sup>100</sup> MMA & Isobar, 2021; Prashant Gutch, 2020.

<sup>101</sup> Apart from findings from Google (2020) study, findings from our enterprise survey also demonstrate this trend: more than half of respondents in the enterprise survey said local language (61%), voice features (13%), and aligning user interfaces to lived experience (53%) were top factors for success with the NHB. Many respondents (58%) also recognized the importance of referrals and word-of-mouth in building essential NHB awareness and social proof for digital services.

## The immense potential of voice and intuitive design



Umesh drives a taxi and runs his business independently. He could not go to school beyond 4th standard and is not proficient with reading and writing. Voice features, however, allow him to run his taxi business on his phone. He uses voice notes to coordinate with customers on WhatsApp. Once they let him know when and where to pick them up, Umesh uses voice search to find the location and directions on Google maps, which he has taught himself to use. He relies on symbols and colors on the map to navigate his route.

*“I am not very educated, but I can make everything work.”*  
 Umesh, left school after 4th standard, taxi driver, Lucknow

Despite significant progress, the NHB—and the suppliers who serve them—still face many barriers related to relevance, user experience, and affordability that prevent the NHB from adopting more and engaging more deeply in online activities. Latent demand may be significant—34% of the NHB say they would like to engage in additional online activities—yet, many of the NHB (both non-users and current users of digital for specific activities) remain constrained by a range of mutually reinforcing obstacles.

Figure 16: Remaining barriers to adopting digital faced by the NHB in 2023

- 1 LOW RELEVANCE**  
 79% of NHB don't perceive high relevance from services and often don't have the time, mental bandwidth, or technological support to discover their utility

*“I don't want to try anything beyond what I use. I am very busy and don't have time to try new things”*
- 2 DIFFICULTY IN USAGE**  
 64% of NHB find digital services difficult to use with complicated user journeys or limited feature customization (like language/ voice)

*“Returning products on Amazon is difficult and I don't have time to figure out these complex apps. I even downloaded Moj but it was tough to understand and hence I deleted it”*
- 3 SAFETY CONCERNS**  
 66% of NHB face or are worried about not having enough privacy and encountering harms

*“I have never gone online to find a job. These job agencies can defraud you by taking a commission from you and sending you somewhere where there is no job”*
- 4 TECHNICAL CONSTRAINTS**  
 60% of NHB report low memory as a reason for uninstalling apps

*“I had downloaded games on my phone but then it would hang a lot and take space, so I deleted all of them”*
- 5 LACK OF SOCIAL PROOF**  
 54% of NHB are held back by limited use of some digital services in their immediate family/ friends' circles

*“We don't sell our crops online. Maybe my husband knows more but I haven't seen anyone who does this. I have heard of people earning money from home but that is mostly for office work.”*
- 6 LOW RELIABILITY**  
 55% of NHB do not realize expected benefits from the service due to structural challenges (like internet gaps) or quality issues

*“If there is no network, or you don't have mobile recharge, how will you pay? The shopkeeper will beat you up”*
- 7 LOW AWARENESS**  
 41% of NHB continue to not know about specific services or the right tools for their context

*“I only trust what little I know. I don't know anything beyond that or engage with it”*
- 8 LOW AFFORDABILITY**  
 31% of NHB find it hard to pay for digital services (especially as recurring or large ticket payments)

*“I tried to use Practo during the Covid-19 pandemic, but it was asking for a lot of money, so I did not”*

Source: Dalberg NHB Main Survey, 2023 (n = 15,512)

**Our research highlighted some pointers on addressing these challenges.** Through our NHB survey we uncovered key barriers to digital adoption and some insights into their preferences while engaging online. Our HCD interviews, enterprise survey, expert interviews, and secondary research provided rich additional nuance. Below we present a synthesis of the design factors that appear particularly relevant.

## Demonstrating product value

The NHB often lack time, digital confidence, and money to explore and engage in more digital activities. As a result, many are not aware of the right digital tools for their context and/or find that the digital services that they know are not relevant to their needs. It is critical to provide a very tangible demonstration of an app's value early in the process of reaching out to and engaging with the NHB. This includes:

- Providing immediate (often monetary) benefits early in the onboarding phase to keep the NHB invested in the service.

***“It took more than three hours for Dunzo to assign an order to me. I uninstalled the app the same day. Getting even the smallest offer or cashback makes you feel like a winner.”***

**Hemlata, 32, Swiggy delivery partner, Mumbai**

- Drawing on the experience of others within their close and trusted circles who have used an app successfully to provide social proof of tangible value for the NHB (beyond just word-of-mouth marketing).



***“A lot of [the] NHB use apps via word of mouth. Identifying influencers from the local area is key for adoption.”***

**Deepti, Amazon**

## Building confidence and ease during onboarding and usage

Even after being convinced of an app's value, the NHB still face difficulties finding, onboarding onto, and using digital apps—often due to a lack of the necessary digital skills or confidence. Digital service providers cite discovery, last-mile distribution, and product feature awareness issues among their top challenges with serving the NHB.<sup>102</sup> These challenges in turn may be closely tied to providers being unaware of NHB's digital skill level or being unable to build necessary trust for their digital services. For example, 72% of our enterprise survey respondents who report gaps in their users' awareness of product features do not prioritize trust building, while 60% lack data on users' digital literacy.

<sup>102</sup> Seventy percent of enterprise survey respondents report issues with lack of product / functionality awareness among users when serving the NHB; 61% cite issues with discovery and 56% cite issues with last-mile distribution as challenges.

Providing sufficient guidance and handholding support, suited to the NHB's skill level, is key to building awareness of and confidence in using apps among the NHB:

- Friends, family, or hyper-local influencers who already use an app are important avenues for the NHB to build familiarity and comfort when using new apps. Encouraging them to guide other members of the NHB to undertake a few initial transactions successfully is key to driving sustained, independent usage by new users.

***“A company agent came with my friend to install the Amazon Pay app. I would not have entertained the agent if he had come alone. The agent installed the Amazon pay app for me and showed me how to do a transaction. They also told me how I can use the app to do mobile and DTH recharge, book train and bus tickets, get cashbacks, etc. Once they taught me, I also guided several others.”***

**Om Prakash, 28, runs a village service center, Masira**

- Discovery and onboarding can be further simplified through pre-loaded apps, referrals, and download paths that simplify navigation through the app store.



***“People do not know how to discover apps for specific use cases; for example, searching for Kannada on the app store is a challenge.”***

**Akash, Indus OS**

## Overcoming language barriers

Literacy remains a constraint—and is a focus area for tech suppliers. Despite the success of early voice and local language features, the extent of the NHB's digital engagement remains tied to literacy.<sup>103</sup> Our enterprise survey showed that many suppliers are excited about innovating at the intersection of voice and AI.

- Simplifying translated language to reflect common parlance, augmenting the ability of local language interfaces to adapt to different dialects, providing a flexible choice of language across different functions, and even adapting UI/UX to better suit local languages and scripts can help minimize friction in use. Particularly for those with lower literacy, making voice features more multilingual and responsive (for example, in the form of chatbots) could be game changing. Moving beyond translations toward original local language content can improve relevance.



***“AI/ML, voice-based interface, translation services into local language, [and] visual cues for guidance are technologies / innovations to explore to be more inclusive of [the] NHB.”***

**Enterprise survey respondent**

***“I watch content in Kannada, but I prefer the app to be in English even though my knowledge [of English] is limited. In Kannada, the names are different and difficult to understand.”***

**Narayanswamy, 47, farm owner and worker, Adde Vishwanathpura**

<sup>103</sup> Among NHB who do not read and write English well, 9% are power users, while a significant majority of 58% are passive users. In contrast, one-fourth of those who read and write English well are power users and 21% fall into the passive category.

## Designing with an “NHB-first” lens

The NHB’s user experience is influenced by factors that may not have as significantly affected earlier, relatively more affluent users—e.g., literacy gaps, family censure, and device constraints. Their usage patterns include distinct workarounds. For example, the NHB often memorize the key user pathways while using an app; complex or atypical design would significantly add to their mental load. Overcoming these gaps calls for NHB-first design that is sensitive to these needs.

- Relevant and self-explanatory visual cues along with simple navigation (that ideally draw from standardized design norms) are very important for users with low literacy. For example, the NHB prefer linear (forward and back) navigation and find complex hierarchical navigation structures hard to follow.<sup>104</sup>

***“I like Swiggy more than Zomato because it’s easier to understand. Zomato is confusing and it’s hard to find what you want on it.”***

**Priyanka, schoolteacher, Lucknow**

- Providing greater in-app control and privacy can be strong value propositions. This is especially the case for women, many of whom feel the need to protect themselves from unwanted, harassing messages and from censure from their families.

***“Sometimes I use Facebook to advertise my clothes, but WhatsApp is more useful for me because it only has people I know and hence I trust it more. There is more fraud on Facebook; men pretend to be women and try to talk to you, and you get thousands of requests.”***

**Hasina, salon owner and runs a garment shop, Bangalore**

***“I don’t post ads on Facebook because my relatives will question me and make comments. Instead, I used to use Instagram, but now my relatives have started using that also.”***

**Hemlata, 33, beautician with Urban Company, Mumbai**

***“I wish the app store had some sort of trust rating to help me figure out which apps are trustworthy—something like veg and non-veg labels on food.”***

**Preeti, resale business owner, Mumbai**

- As the NHB uninstall and re-install apps based on need, lighter app versions or versions that can be easily zipped when not in use can minimize re-onboarding hassle while also optimizing use of limited RAM.

<sup>104</sup> (Designing for Digital Confidence, n.d.).

## Differentiating pricing models

Finally, affordability concerns, which sometimes exacerbate technical constraints (like limited memory and unreliable internet), also limit the NHB’s digital engagement. Mirroring the NHB’s affordability concerns, suppliers see low revenue potential as one of their greatest challenges in serving the NHB. Differentiated pricing models can help:

- More than twice as many members of the NHB prefer to pay for digital services through micropayment and pay-per-use models as prefer to pay through recurring subscription models.<sup>105</sup> Enabling such “sachet” payments can gradually build the NHB’s comfort with paying for and trust in digital services.<sup>106</sup>

### LOOKING AHEAD → →

While the ecosystem has come a long way, much more can be done to intentionally design devices and services for the NHB. Building on the progress already made, suppliers will need to invest more deeply in understanding what works for the NHB and design accordingly—and move past some design principles that worked well for early adopters. Innovations in communication and marketing can help the NHB discover, understand, and adopt offerings relevant to them. Existing communities of practice can anchor these efforts and build toward NHB-first design.

<sup>105</sup> Fifty-seven percent of the NHB pay per use; 23% prefer subscription-type payments; 16% have no preference.

<sup>106</sup> Dia Rekhi, 2023.

# THE JOURNEY AHEAD

**Digital technology is now a part of the day-to-day lives of the NHB in numerous and varied ways.** Online tools are helping the NHB build connections, gain new skills, carry out their livelihoods, and transact with each other. The overall experience of digital technology, however, has been far from uniformly positive. While a few of the NHB have seen positive impact across the board (these are the “big winners”), many have seen limited impact and/or have been actively harmed in the process. Moreover, access to and adoption of digital services (and the subsequent impact this can bring) continue to be influenced heavily by social inequalities. This manifests most clearly in the persisting digital gender gap and the level of online harm faced by disadvantaged groups.

**Shaping and serving the digital lives of the NHB is no longer a purely technological endeavor.** The next step of growth requires also addressing more fundamental human questions and challenges—who should and should not be online; what makes an online experience meaningful for the NHB; what constitutes an equitable digital experience? To do so, we must collectively contribute in new ways as key stakeholders to the digital ecosystem—all of us, from technology providers to funders, policymakers, researchers, and civil society organizations.

**Our study uncovers four priority actions to help achieve a safer, more inclusive digital society that benefits the NHB.** In the following pages we explore how we can shift our ways of working (as individual actors and collectively) to create the conditions for the rest of NHB to come online and benefit from the experience. For further details on how to take these actions, we urge readers to refer to the extensive work done by many others in these thematic areas.

## Recommendation 1:

**Prioritize the inclusion of everyone—and especially those from traditionally excluded, marginalized, and disadvantaged backgrounds—in the design of digital infrastructure, products, and services**

The more the NHB engage online—especially with more complex digital services like digital for work, skill training, digital public services, etc.—the more they can potentially derive from the experience. However, barriers like difficulty of use, lack of familiarity, or low perceived relevance limit the digital engagement of many of the NHB, especially those who are from non-metro regions, less fluent in English, or less financially autonomous.

These barriers can be overcome by prioritizing the following shifts in our ways of working:

1. **Leverage foundational digital rails** like DPI (Digital Public Infrastructure) (alongside technologies poised for tremendous growth like AI) as tools to drive inclusion
2. **Build bridge solutions** to help the NHB ease into using digital services and increase their trust, while also limiting the opportunity cost of being unable to use fully digital solutions

All key stakeholders have a role to play in increasing and deepening the NHB's digital engagement:

## Tech companies and entrepreneurs . . . . .

### Build bridge solutions

- Develop and promote low-tech solutions that can work in limited- or no-internet settings

## Government and policymakers . . . . .

### Leverage foundational rails to drive inclusion

- Review inclusivity of current DPIs and set target inclusivity standards for both existing and upcoming DPIs (for example, set gender or age-specific UPI transaction targets, data on which are currently not available)

### Build bridge solutions

- Augment the network of decentralized digital / phygital access points like Customer Service Centers by supplementing them with ASHA / Anganwadi networks
- CSOs could also support government efforts by encouraging local influencers and early adopters to provide necessary support to the NHB
- Expand the scope of these services and set benchmarks for higher quality of service

## Funders . . . . .

### Leverage foundational rails to drive inclusion

- Help government conceptualize, invest in, and develop DPIs that can further inclusion. For example: a DPI to facilitate multilingual / voice-based interfaces (like Bhashini) or DPIs that can deliver higher utility for traditionally excluded segments (e.g., to help people with disabilities to locate relevant public services more easily)

### Build bridge solutions

- Invest in and support companies that develop low-tech solutions which can help unlock an additional market segment, currently deemed unserviceable

## Recommendation 2:

### Address the root causes of the persistent gender gap

Ongoing efforts have managed to bring tens of millions of women online directly (and even more in proximity to digital services through others in their household). However, the gender gap in digital technology persists across access, usage, and impact. Closing this gender gap at various steps of NHB digital engagement offers clear personal advantages to the user (improved confidence, awareness), their immediate household (improved livelihood opportunities, standard of living, household dynamics), and their community (more socio-politically engaged citizenry). Proactive efforts that encourage women to be creators, contributors, and consumers is a first step in that direction.

Drawing from our study, we believe three shifts to our current ways of working are critical to closing the gender gap

1. Forge innovative partnerships during product design and execution of go-to-market (GTM) to collectively drive product engagement and **address the social norms** limiting it in the first place
2. Bring exposure, digital literacy, online safety, and education around **appropriate online behavior into schools** at an appropriate age. This will help normalize the idea that girls and women have an equal right to be online, prepare children and adolescents to engage online safely, and promote more gender equitable attitudes and behaviors
3. Incentivize, encourage, and enable **gender positive** efforts geared toward overcoming the gender digital divide

Various stakeholders have a role to play in collectively enabling and executing these shifts. A few ideas on key actions that can be taken include:

## Tech companies and entrepreneurs . . . . .

### Tackle restrictive social norms

- Partner with CSOs with strong community connections to identify and implement innovative go-to-market (GTM) approaches that encourage and destigmatize NHB women's digital engagement

### Incentivize gender positive practices

- Set up systems to track and monitor gender-disaggregated data on usage, level of engagement, and impact. Use these insights to drive business decision making

## Government and policymakers . . . . .

### Start young with digital gender inclusion

- Prioritize exposure, digital literacy, online safety, and education around appropriate online behavior within broader school education revamp efforts. Ensure that curriculum is gender sensitive and include elements of training instructors/ teachers to eliminate biases against women and girls' use of digital technology

### Incentivize gender positive practices

- Offer funding support and/or tax breaks to firms closing the gender gap in engagement, especially for services with clear gender gap (payments, digital for work, mobility)



## Funders . . . . .

### **Tackle restrictive social norms**

- Fund innovative partnerships between various actors to overcome social norms and unlock social / financial value

### **Incentivize gender positive practices**

- Set the tone and accelerate the pace of progress toward gender equality by making investments with a strong gender lens and committing to them publicly

## CSOs . . . . .

### **Tackle restrictive social norms**

- Support technology service providers that introduce women to and educate them about digital services with the potential to unlock significant personal and societal value
- Continue to nurture peer-to-peer learning networks among women and create safe private spaces for women to explore digital services

### **Start young with digital gender inclusion**

- Support government (as education-focused CSOs) in designing and executing school-level programs that expose students to digital tools from an early, appropriate age and help normalize the idea that girls can benefit from being online

### **Recommendation 3:**

### **Build a safe online experience.**

The prevalence of digital harms suffered by the NHB negatively impacts their digital engagement on multiple levels. Apart from limiting NHB adoption and use of services, it is also a key contributor to negative impact from being online for the NHB. Creating a meaningful experience for the NHB online therefore depends on capitalizing on the upside of digital tools as much as it does on limiting the impact of digital harms.

To make the online experience safer and more productive for the NHB, a few fundamental shifts are needed in how we recognize, prioritize, and work against digital harms:

1. **Adopt a holistic approach** to defining and regulating online harms; expand the current narrow focus on a few types of harms, while also emphasizing at risk segments, like transgender people, people with disabilities, etc.
2. Clearly **establish the accountability** and liability of all key digital ecosystem actors for ensuring the safety of the NHB online
3. Develop an enabling ecosystem where **safety, innovation, and financial returns** are mutually reinforcing (and not competing priorities)

Here are a few high-priority actions that various stakeholders can take to enable these shifts:

## Tech companies and entrepreneurs . . . . .

### **Develop a holistic view of harms**

- Prioritize harms beyond cyber fraud and deception in digital safety efforts—focus, as well, on online abuse and psychological harms. Anticipate and institute protection measures against harms from emerging technology (for example, deep fakes from AI)

### **Simultaneously enable safety, innovation, and financial returns**

- Invest in digital safety awareness campaigns that can set a minimum threshold expectation for digital safety and create a differentiated value proposition for safer digital experiences online

## Government and policymakers . . . . .

### **Develop a holistic view of harms**

- Expand the regulatory purview of digital harms beyond the current focus areas of fraud and online harassment to also include psychological harms
- Institute specific policies to monitor and mitigate digital harms for the most at-risk segments of users
- Prioritize digital safety and appropriate online behavior education in schools to build norms and expectations around online safety from a young age

### **Simultaneously enable safety, innovation, and financial returns**

- Strengthen the digital safety rails within available DPIs (like the UPI stack)

### **Establish clear targets and accountability for online safety**

- Develop and execute policies that set online harm reduction targets and assign clear accountability and liability to all actors across the digital ecosystem (service providers, media intermediaries, ISPs, government entities, and individual citizens) in case of digital harm occurrence

## Funders . . . . .

### **Simultaneously enable safety, innovation, and financial returns**

- Develop public goods that can increase safety, like new safety-focused technology tools (identity protection, vulnerability scanners, etc.) and safety playbooks that gather ecosystem-level lessons and guidelines for minimizing digital harms
- Support service providers in investing in digital safety awareness campaigns, especially for non-financial digital harms



## CSOs

### Develop a holistic view of harms

- Share insights from on-the-ground experience to advocate for and support government efforts to expand the understanding of digital harms (beyond financial fraud)

### Simultaneously enable safety, innovation, and financial returns

- Help technology service providers and funders execute digital safety awareness campaigns and shape consumer perception on the value of digital safety

### Recommendation 4:

## Invest in more deeply understanding and designing for the needs of the NHB and the realities they face

This study represents an important step in understanding the NHB as a distinct and diverse set of digital users. However, there is still much to learn about their interactions with digital technology. These gaps in our understanding prevent us from making context-specific, relevant, and material shifts to our approach to serving the NHB. Diverse research approaches are needed to synthesize and augment available knowledge, and to create new mental models. New research can shine a spotlight on specific aspects of digital experience and offer insights into how to improve the digital lives of the NHB.

This study points to a few high-priority themes for further research, including:

#### 1. Research to build new mental models and ways of working

- a. Build a comprehensive framework / lexicon to understand digital harms— encompassing harms that are overlooked, under-prioritized, or nascent but likely to become critical—and identify best practices to address them
- b. Create a playbook on product design and GTM to ease NHB adoption and uptake

#### 2. Focused investigation of specific, persistent challenges

- a. Explore the impact and dependence of digital adoption on social norms and surrounding context—especially in terms of how this context contributes to a persistent intra-household digital gap—so that effective means of overcoming normative barriers can be identified
- b. Understand the causes of perceived relevance or irrelevance of digital services and products among the NHB (in order to build the next generation of relevant digital offerings)

#### 3. Trace the NHB's evolving digital journeys, specifically to track progress and identify the next set of priorities for the ecosystem

- a. Conduct recurrent, longitudinal studies on the digital lives of the NHB, spanning access, usage, impact, and harms (or any other key themes) to record change over time

**Different ecosystem stakeholders are distinctly equipped to carry forward specific aspects of this suggested research**, from socio-economic researchers (digital technology and social norms) to technology companies (playbook on product design; understanding relevance) to development sector entities (lexicon of digital harms; longitudinal comprehensive NHB studies). Government, policymaker, and funder support is also needed to provide essential financial and operational resources for conducting this research and disseminating it to the appropriate stakeholders.

**Our snapshot of the digital lives of the Next Half Billion highlights how digital technology can be a force for good** in changing the lives of these first-time internet users. It also uncovers distinct risks and priorities for the future: if the benefits of digital tools are to outweigh dangers and equitably drive positive impact for all, entrepreneurs, funders, CSOs, and government must pivot toward building a more inclusive and safe digital world.

**The prospects and possibilities that emerge for the NHB's digital adoption are exciting; the next step must be to safeguard these opportunities.** We hope this study serves as the first of many chronicling the evolving digital lives of the NHB, encourages others to also be invested in the NHB's digital journey, and offers guidance on how best to contribute to it.

# ANNEXES

## Glossary of terms

TERM	DEFINITION
Digitally dark	People who don't have access to the internet
Phygital	Describes hybrid (physical + digital) avenues for consumers
Digital-first jobs	Jobs that require technology and internet to be done
Nanopreneurs	Small enterprises such as street vendors, micro-retailers, and wholesalers
Power users	Members of the NHB who undertake most of the activities surveyed online and have digital tools highly integrated in their lives
Pathfinders	Members of the NHB who undertake many activities online (though fewer than power users)
Aspirers	Members of the NHB who have just begun using or have a desire to use digital for activities beyond communication and content consumption like ecommerce and digital payments
Passives	Members of the NHB whose digital usage is limited to basic services like communication and content consumption
Big winners	Members of the NHB who report positive impact from going online on almost all of the individual, familial, and community parameters surveyed
Other beneficiaries	Members of the NHB who report positive impact on at least twice as many parameters surveyed as negative, but not all, from going online
Neutral	Members of the NHB who report neither positive nor negative impact on most parameters surveyed, from going online
No net impact	Members of the NHB who report just as much positive as negative impact, across various parameters surveyed from going online
Net negative impact	Members of the NHB who report a net negative impact from going online, across the parameters surveyed

## Abbreviations and acronyms

ABBREVIATION	EXPANSION
AI/ML	Artificial intelligence / machine learning
CRM	Customer relationship management
CSC/JSK	Common Service Center / Jan Seva Kendra
CSOs	Civil society organizations
DFI	Development financial institution
DPI	Digital public infrastructure
ERP	Enterprise resource planning
FIDO	Fast IDentity Online (open-source online authentication standard)
HCD	Human-centered design
ICT	Information and communications technology
ISP	Internet service provider
NHB	Next Half Billion
RBI	Reserve Bank of India
UI/UX	User interface / user experience
UPI	Unified Payments Interface

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