Sattva Knowledge Institute SKI primer

INEQUITY IN DIGITAL HEALTH SOLUTIONS

August 2022

Acknowledgements

About the Authors

This primer has been written by **Granthika Chatterjee.** The data analysis was supported by **Arnab Mukherjee, Pragati Keswani, Anshika Singh** and **Suraksha Jain**. The technical review was done by **Lakshmi Sethuraman.**

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Sattva Knowledge Institute (SKI), established in 2022, is our official knowledge platform at Sattva. The SKI platform aims to guide investment decisions for impact, shedding light on urgent problems and high potential solutions, so that stakeholders can build greater awareness and a bias towards concerted action. Our focus is on offering solutions over symptoms, carefully curating strong evidence-based research, and engaging decision-makers actively with our insights. Overall, **SKI aims to shift intent and action toward greater impact by influencing leaders with knowledge.** All of our content proactively leverages the capabilities, experience and proprietary data from across Sattva.

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Glossary

1	**ABDM**	Ayushman Bharat Digital Mission
2	**ABHA**	Ayushman Bharat Health Account
3	**AIIMS**	All India Institute of Medical Sciences
4	**CAGR**	Compound Annual Growth Rate
5	**CSO**	Civil Society Organisation
6	**CHI**	Center for Health Informatics
7	**DGHS**	Directorate General of Health Services
8	**EHR**	Electronic Health Records
9	**E-pharmacy**	Online pharmacy
10	**GoI**	Government of India
11	**HFR**	Healthcare Facility Registry
12	**HPR**	Healthcare Professionals Registry
13	**ICT**	Information and Communications Technology
14	**ICMR**	The Indian Council of Medical Research
15	**IVRS**	Interactive Voice Response System
16	**MeitY**	Ministry of Electronics and Information Technology, Government of India
17	**mHealth**	Mobile Health
18	**MoHFW**	Ministry of Health and Family Welfare
19	**NCD**	Non-Communicable disease
20	**NHSRC**	National Health Systems Resource Centre
21	**NIC**	National Informatics Centre
22	**PHC**	Primary Health Centre
23	**PHR**	Personal Health Records
24	**PMJAY**	Pradhan Mantri Jan Arogya Yojana
25	**PM-WANI**	Prime Minister Wi-Fi Access Network Interface
26	**UX**	User Experience
27	**UPI**	Unified Payments Interface
28	**UI**	User Interface

EXECUTIVE SUMMARY

Public and private investment, policies, and solutions are fueling growth in India's digital health landscape and are one of the key bets to achieving Universal Health Coverage.

India's digital health market has a Compound Annual Growth Rate (CAGR) of nearly thirty per cent, with increasing investments globally and in India. Political tailwinds include Prime Minister Wi-Fi Access Network Interface(PM-WANI), Pradhan Mantri Gramin Digital Saksharta Abhiyan, Ayushman Bharat Digital Mission (ABDM) and others. The many challenges related to access, affordability, and quality can be bridged if technology is used effectively and equitably. However, the digital divide resulting from various socioeconomic determinants prevents the underserved from accessing the benefits of digital health.

Most digital health solutions do not cater to the digitally inactive underserved population.

Analysis of over forty digital health solutions revealed that most solutions are inequitable for customers, because of language barriers, high costs, the prerequisite of a high digital literacy level and smartphone dependency. Similarly, B2B digital health solutions that catered to healthcare providers were inequitable due to high costs, language barriers and internet requirements.

Philanthropy can help bridge this gap by addressing levers around navigating the policy and regulatory ecosystem, strengthening infrastructure, and creating structured channels for testing and incentivising adoption.

Philanthropy can help solution developers navigate the complex regulatory ecosystem by providing technical expertise and supporting incubators by helping startups identify areas of convergence with the healthcare delivery system. It can also enable greater uptake of digital health solutions by strengthening digital infrastructure at the primary healthcare level, funding low-resource technology solutions for the underserved population, and augmenting efforts by the Government of India aimed at higher ABDM penetration. Furthermore, philanthropic interventions are needed to create a structured environment with active ecosystem stakeholder engagement to enable solution developers to effectively test their solutions and increase adoption amongst users. This can be done through stakeholder value and successful use case demonstration, capability building of healthcare providers, and acquainting citizens with the latest digital health schemes and policies, thus equipping them with the ability to leverage digital health solutions to their full capacity.

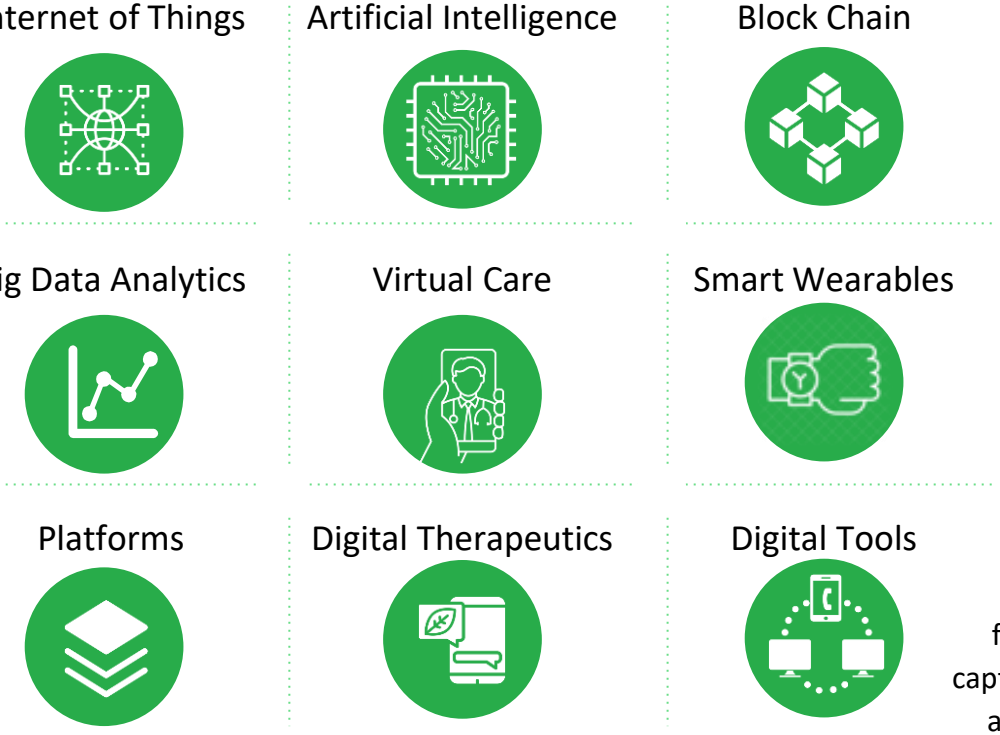
DIGITAL HEALTH SOLUTIONS ARE EMERGING AS A GAME CHANGER

What is Digital Health?

Digital health refers to the use of digital, mobile and wireless technologies to support the achievement of health objectives. Despite the boom in the technology sector, its application to healthcare is largely untapped. Digital Health has the potential to make health systems more efficient and sustainable, enabling them to deliver good quality, affordable and equitable care.

Digital health technologies can..

- Internet of Things
- Artificial Intelligence
- Block Chain
- Big Data Analytics
- Virtual Care
- Smart Wearables
- Platforms
- Digital Therapeutics
- Digital Tools



for remote data capture, data storage, and data sharing

.. enhance health outcomes by improving

- Medical diagnosis
- Data based treatment decisions
- Continuum of care
- Self management of care
- Evidence based knowledge

(World Health Organization 2021)

Globally, the digital health landscape is maturing rapidly (Precedence Research 2022).

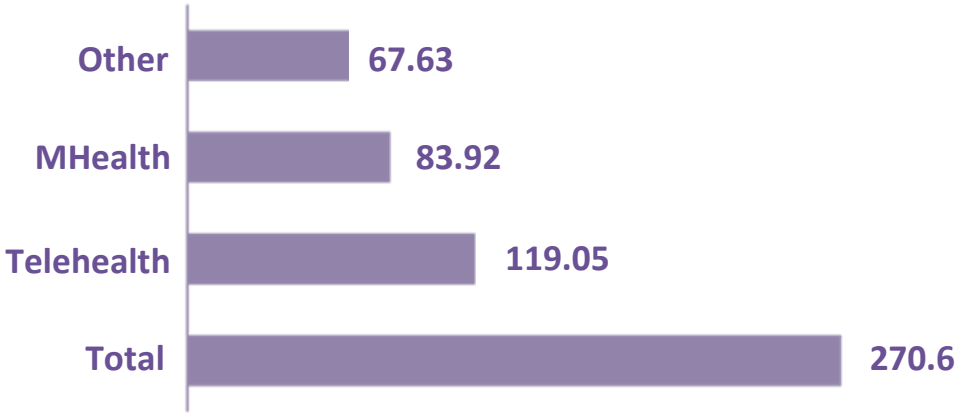
Global digital health investment in 2021 reached
$57.2 billion
with a CAGR of 19.2% for 2022-2030

The WHO Global Strategy on Digital Health 2020-2025 ratified by Member States with four strategic objectives:

1) Promote global collaboration and advance the transfer of knowledge on digital health.
2) Advance the implementation of national digital health strategies.
3) Strengthen governance for digital health at the global, regional and national levels.
4) Advocate people-centred health systems that are enabled by digital health.

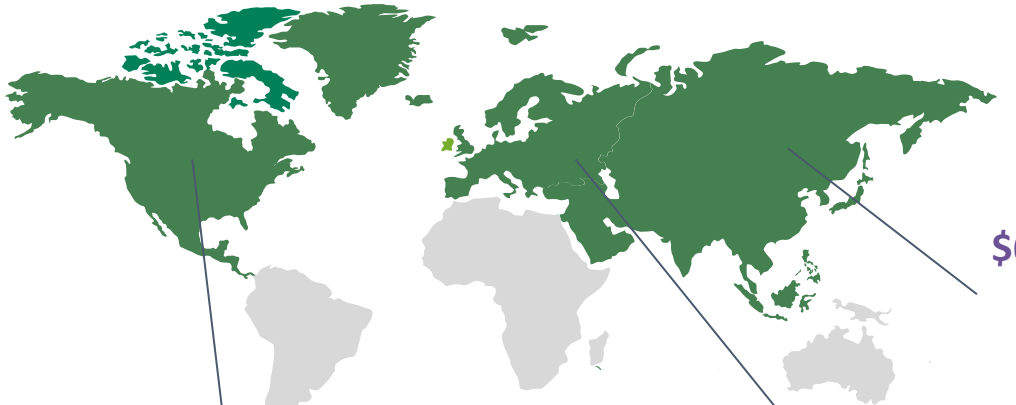
Value of Global Digital Health Market in 2021 in US Billions ($)

Across Product Types



(GrandView Research)

Across Geographies



$ 71.72 Bn: 2021
valuation
20% CAGR

$97.21 Bn 2021
valuation
17.7% CAGR

$69.45 Bn 2021
valuation
21.7% CAGR

India too is witnessing a rapid maturing of the digital health ecosystem.

High government focus on driving adoption of digital and digital health goods

The Jan Dhan accounts, Aadhar card and Mobile linkages are enabling citizen participation in digital and financial spaces.

Government schemes such as **PM-WANI, Pradhan Mantri Gramin Digital Saksharta, Abhiyan, Pradhan Mantri Jan Arogya Yojana (PMJAY)** focus on providing affordable solutions to avail digital services.

Ayushman Bharat Digital Mission aims to leverage digital solutions to bridge the gaps between citizens and other stakeholders in the healthcare delivery mechanism.

238M+ Ayushman Bharat Health Account (ABHA) IDs generated*

983 active integrators*, 60 successful integrators*

1,40,671 health facilities and 60,063 doctors registered

As of 6th September 2022 (National Health Authority, ABDM n.d)

High growth rate of private market

$5 billion venture capital has been raised across 596 funding deals (Healthtech Alpha 2022).

7,128 HealthTech startups populate India's digital healthcare ecosystem (Gupta 2022).

India's digital economy could contribute 18–23% of overall economic activity by 2025 (MeitY).

By 2025 digital health market is poised to reach US $504.4 billion in India growing at a CAGR of 29.6% (Singh 2020).

Digital health is evolving to be a game changer for accelerating universal health coverage.

There are many gaps in access, affordability, and quality of healthcare.

1 government hospital per 90,343 people (Oxfam 2021)

5 beds per 10,000 people (Oxfam 2021)

of expenses were paid out of pocket (Yadavar 2019)

1.6 million deaths were caused by the poor quality of healthcare in 2018 with an average of 4,300 preventable deaths per day (Iyer 2018)

The creation and adoption of digital health solutions is helping bridge these gaps

Teleconsultation improves access to affordable quality healthcare:

- 5 crore Indians accessed teleconsultation services in 2020. 80% were first-time users and 40% were from non-metro areas. (BCG FICCI 2021).
- Boosting **e-clinics** across rural India that offer kiosk-based teleconsultations for those without Information and Communications Technology (ICT) access (Kaul R, 2022).

E-pharmacies can increase access to medication:

- e-Pharmacies will likely reach 70 million households by 2025, improving access to medicines in rural areas where retail outlets are limited (Srinath 2020).

Electronic Health Records keep back-ups of patient records at low costs and ensure affordable high-quality, evidence-based care:

- 94% of hospitals used their Electronic Health Records (EHR) data to perform hospital processes that inform clinical practice (Parasrampuria 2019).

InsurTech funding has doubled in 2 years, which might make insurance more accessible (BCG 2022).

However, citizens and health care providers are divided across a continuum, and access to solutions is inhibited for many.

Healthcare Providers

Citizens

Digitally Inactive	Digitally Aware	Digitally Competent
• Healthcare providers with no ICT infrastructure at facility. • Use of paper-based records and bills. • Archetype includes individual doctors' chambers and small clinics.	• Minimal ICT infrastructure like a desktop at reception and billing capturing minimum patient data. • Archetype mostly includes mid-sized hospitals and nursing homes of tier II and III towns.	• High-end ICT infrastructure and end-to-end digitisation. • Cashless insurance claims and Personal Health Record (PHR) are shared across different branches. • Archetype includes large corporate hospitals.
~193 Mn people are without any ICT device access as of '21 (Kemp 2022)	**~320 Mn people have access to features phones** (Bendre, R 2021)	**~530 Mn people have smartphones** (Bendre, R 2021)
• **No ICT device access,** low digital literacy and socioeconomic status. • Marginalised households in predominantly rural and a few urban geographies.	• **Limited access to budget or feature phones,** social media and Unified Payments Interface(UPI) usage, and a preference for digital content in regional languages. • People with some primary or secondary education, and from low to middle-income households in rural and semi-urban areas.	• **Access to smartphones with** an active presence on social media and usage of UPI. • People with secondary education and above, and from middle to high-income households in urban and metropolitan areas.

INEQUITY ACROSS DIGITAL HEALTH SOLUTIONS

A landscaping exercise was performed for 44 solutions, including the 34 integrated with ABDM (as of June 2022) and the top ten most funded health tech startups.

01

IDENTIFY EQUITY INDICATORS FOR DIGITAL HEALTH PRODUCTS

- Identify relevant product features that determine where a product stands in terms of its digital competency requirement and sophistication.
- Assign indicators to these determinants.

02

COLLECT DATA FOR SOLUTIONS INTEGRATED WITH ABDM

- Source data for these indicators for all the solutions integrated with ABDM (as of June 2022) and the top 10 most funded health tech start-ups.

03

SCORE THE PRODUCT FEATURES BASED ON USER ABILITY TO NAVIGATE THE PRODUCT

- Apply a scoring framework to assign values to these determinants (e.g. Can the solution only be used with smartphones? Is the solution affordable?).

04

CREATE OVERALL PRODUCT SCORE

- Each determinant is scored from 0 to 1.
- For example, in terms of geography, a score of 1 means the product is accessible in all regions including rural areas.
- The overall score is an average of scores across all determinants and scales from 0-1. 1 indicates a solution that is accessible to all populations, including the digitally inactive.

Key insight: 73% of digital health products cater to only digitally competent groups (Sattva 2022).

Citizens

18/22 solutions were found to cater only to the digitally competent groups.

Primary contributors to digital health inequity:

Language	High Cost	Higher Levels of Digital Literacy	Requirement of Smartphones
Over half of the solutions are offered in only in English when **less than 10%** of the population speaks it.	Only **a third** of products are affordable.	**45% of solutions** need higher levels of digital literacy.	**95% of solutions** function only on smartphones.

Providers

18/27 solutions were found to cater only to digitally competent health care providers.

Primary contributors to digital health inequity:

Language	High Cost	Internet dependency
Less than half the solutions are offered in languages other than English.	Only **a third** of solutions are affordable.	**80% of solutions** lack an offline mode.

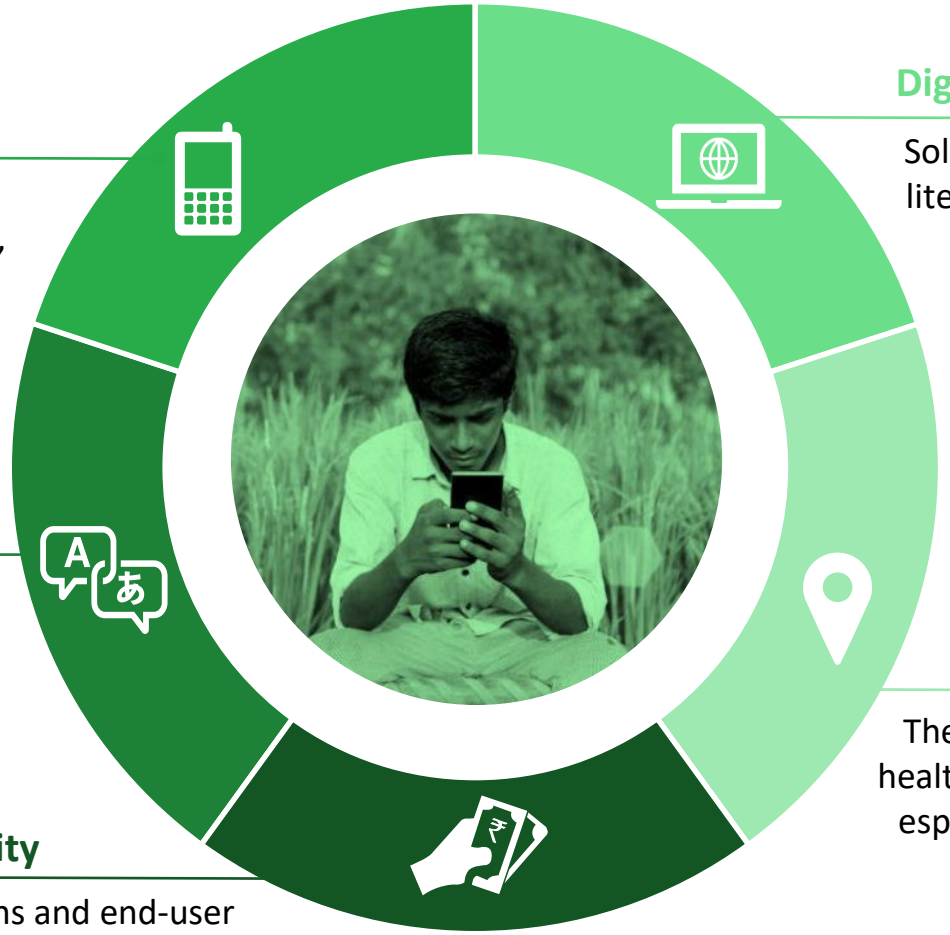
Indicators affecting citizens' ability to access digital health solutions.

Availability across various types of ICT devices

Availability of the solution across different devices like smartphones, budget feature phones and IVRS increases accessibility.

Digital literacy requirements

Solutions requiring higher digital literacy exclude people with low to medium digital skills.



Language

Solutions offered in multiple languages will be accessible to a wider population base.

Geography

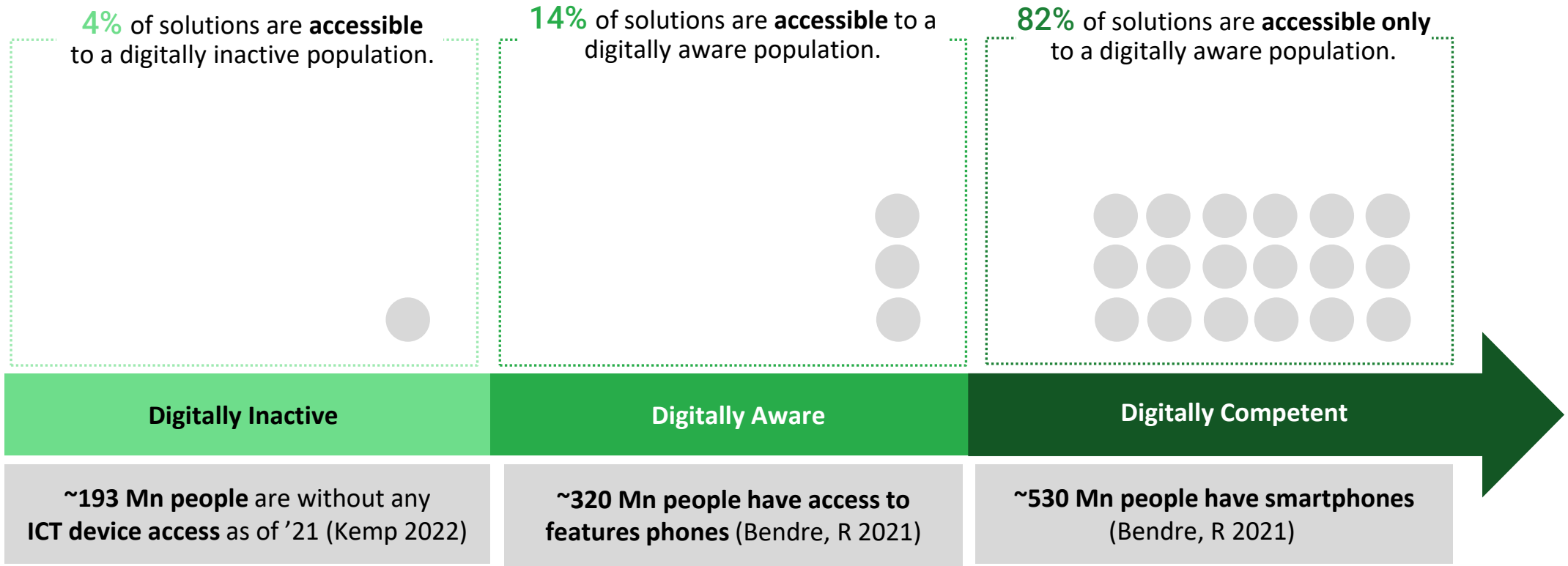
The geographical presence of digital health solutions can affect accessibility, especially for solutions concentrated only in urban geographies.

Affordability

The high costs of solutions and end-user payment models can exclude users who need them the most.

Most digital health solutions are accessible only to digitally competent citizens.

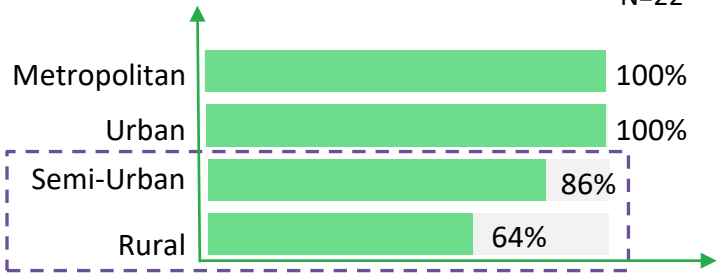
A landscaping exercise was performed for 22 citizen-oriented solutions,
including the ones integrated with ABDM (as of June 2022) and top-funded health tech startups.



Sattva Analysis, List of ABDM integrated solutions as of 13.06.2022, Top 10 funded startups

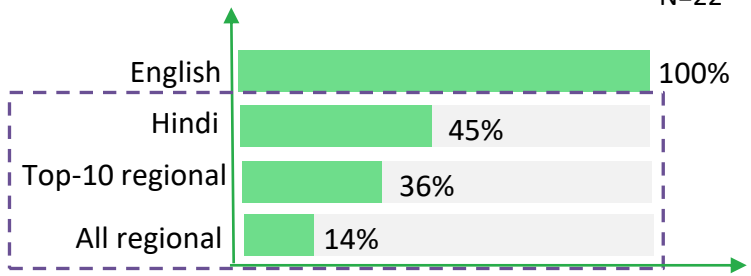
Primary challenges for citizens to adopt digital solutions included ability and willingness to pay, language, digital divide and smartphone requirements.

Geography



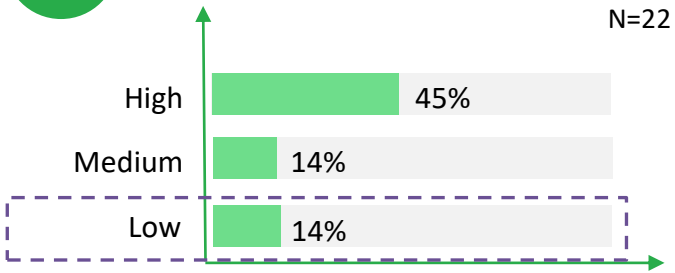
100% of the solutions are available in metro and urban areas, with semi-urban and rural regions lagging behind marginally.

Language



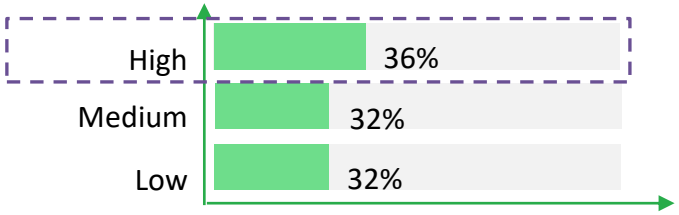
Over half of the solutions are offered only in English, when less than 10% of the population speak it.

Digital Literacy



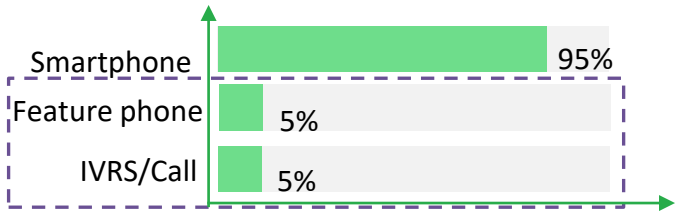
Only 14% of solutions cater to people with medium to low digital literacy.

Affordability



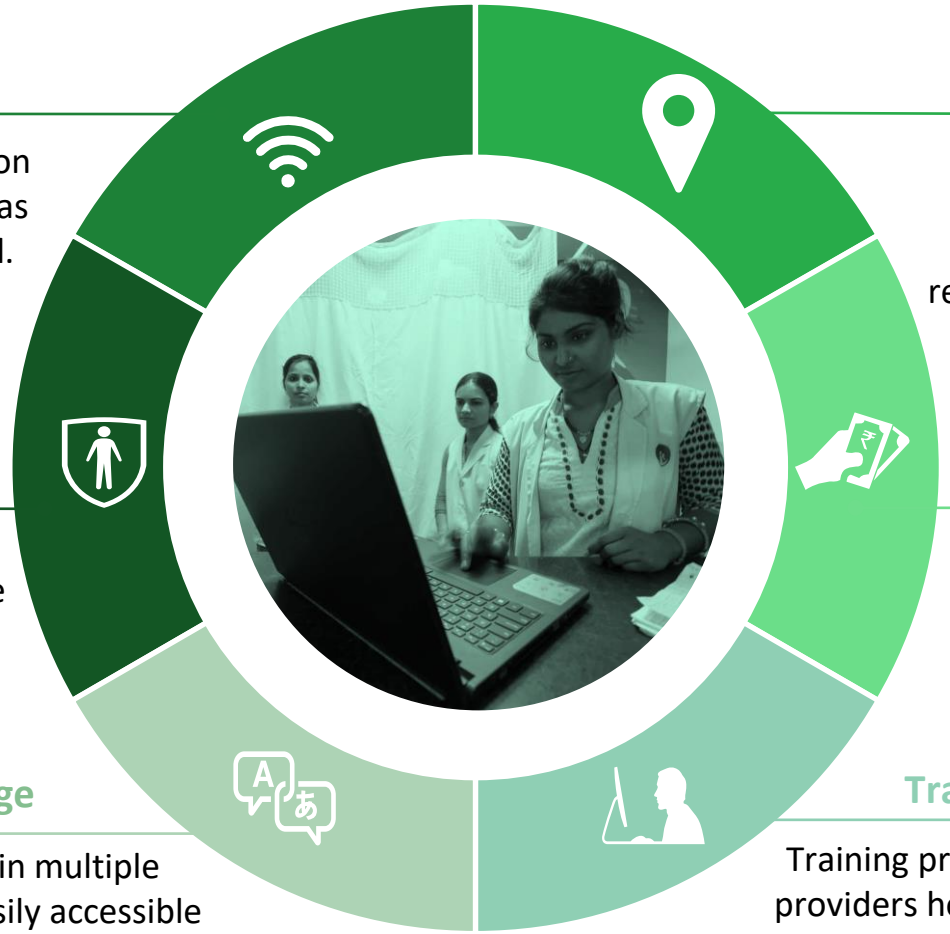
Only a third of products are highly affordable.

Device Requirement



Only 5% of solutions cater to people who don't have smartphones, leaving out 50% of the population.

Indicators affecting digital health solution accessibility for healthcare providers.



Internet dependence

The solution's dependence on the internet can restrict areas in which it can be deployed.

Geography

This factor takes into account the geographical locations where the solutions are based, considering regional variations in internet access and healthcare resources.

Insurance integration

The insurance integration of the solution with government or private insurance schemes can increase its affordability.

Affordability

The cost of solutions can exclude small-scale and fragmented healthcare providers.

Language

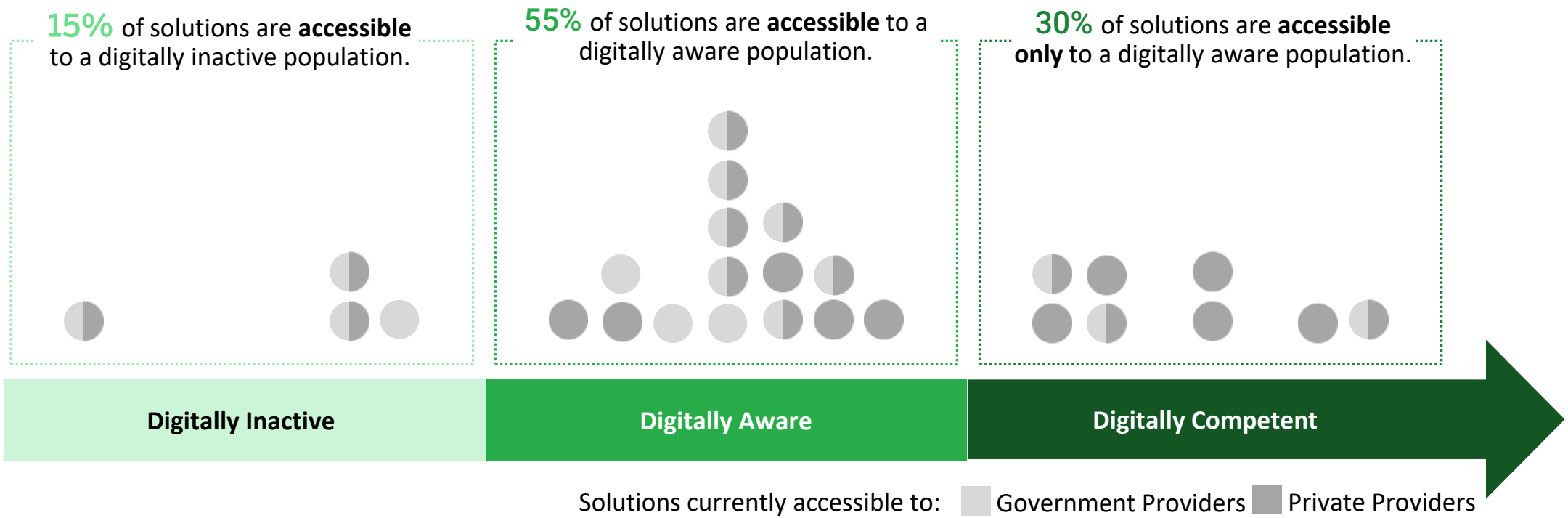
Solutions offered in multiple languages can be easily accessible to all types of health workers.

Training provisions

Training provisions erected to teach providers how to use the product can increase its accessibility.

While there are some solutions accessible to healthcare providers catering to the underserved, the bulk continues to be accessed by digitally aware and competent ones.

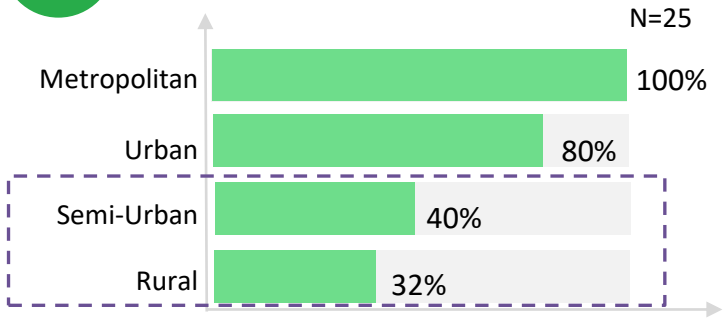
A landscaping exercise was performed for **27 healthcare provider-oriented solutions,** including the ones integrated with ABDM (as of June 2022) and top-funded health-tech startups.



Sattva Analysis, List of ABDM integrated solutions as of 13.06.2022, Top 10 funded startups

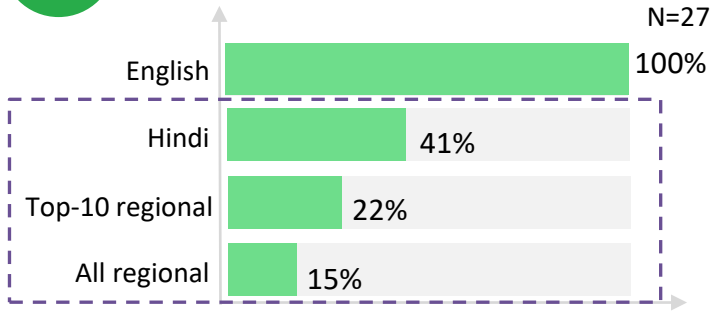
Primary challenges to adoption on the provider side including high cost, language and internet dependence.

Geography



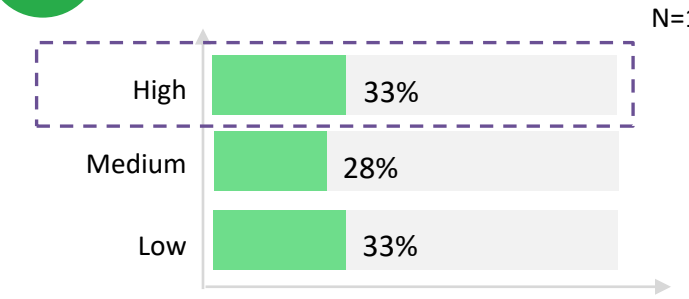
Only a third of solutions are available to healthcare providers in rural areas, who might need them the most.

Language



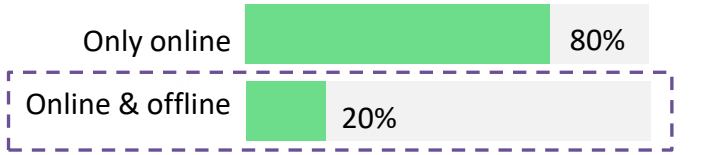
Less than half the solutions are offered in languages other than English.

Product affordability



Only a third of products are highly affordable.

Internet dependence

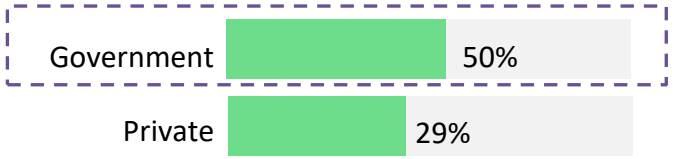


80% of solutions require internet access.

Training

80% of solutions provide training to healthcare practitioners on how to use their services.

Integration with insurance providers*



Only 10 out of 27 solutions were integrated with an insurance providers.

ROLE OF PHILANTHROPY TO ADDRESS INEQUITY

Barriers to addressing inequity include policy and regulatory hurdles, lack of infrastructure, a suitable environment for testing and a lack of incentives for adoption.

Product Ideation and Development	Product Approval	Pilot	Adoption and Scale
Digital health solution providers	Regulatory body	Citizens, patients, public and private hospitals, healthcare providers	Citizens, patients, public and private hospitals, healthcare providers, implementing non-profits
• Little or no incentives to design for equity. • Capturing the value chain and integrating it with traditional healthcare delivery channels.	• Digital health solutions fall under the purview of multiple regulatory bodies under the Ministry of Health and Family Welfare and the Ministry of Electronics and Information Technology. • The current Telemedicine Practice guidelines are a stop-gap measure due to COVID and more comprehensive permanent rules are needed along with e–pharmacy rules that exist as a draft.	• Limited risk capital to fund pilots for underserved geographies. • Lack of structured channels to pilot and test solutions. • Presence of disparate and disintegrated legacy digital systems that makes data migration and integration with new solutions difficult.	• Inadequate ICT infrastructure and intermittent power supply in the last mile. • Absence of digital skills in healthcare providers who are serving the underserved and rural populations. • Lack of health-seeking behaviour in citizens. • High cost of digitisation for small-scale and fragmented providers. • Lack of understanding of clear value proposition for digital health solutions.

Key addressable areas by philanthropy

- Navigating the policy and regulatory ecosystem.
- Strengthening digital infrastructure.
- Availability of a structured environment for trial and testing.
- Incentivising adoption

The role of philanthropy to help increase the adoption of digital health solutions.

Navigate the policy and regulatory ecosystem

- Help solution developers navigate through the complex regulatory ecosystem by creating a shared resource pool of legal and technical advisors.
- Support incubators to help startups identify areas of convergence to integrate with the healthcare delivery system.

Strengthen digital infrastructure

- Strengthening the infrastructure at the primary healthcare level to facilitate the uptake of digital solutions.
- Fund low-resource intensive technological solutions for doctors and healthcare providers in underserved communities.
- Augment Government of India's (GoI) effort of higher ABDM penetration by engaging local Civil Society Organisations(CSOs) to saturate geographies with Health Professional Registry and Health Facility Registry.

Structured environment for trial and testing

- Create a structured environment in partnership with incubators and academic institutions for solution developers to effectively test their solution.
- Equip the testing ground with digital infrastructure such as clouds and testing softwares.
- Create geographical micro-sites in partnership with local government and CSOs to test digital health solutions in a real setting.

Incentivise adoption

- Showcase stakeholder value to drive adoption through the successful demonstration of use cases, like the reduced burden of day-to-day activities and increased efficiency through task shifting and sharing.
- Build the capability of healthcare providers in partnership with state academic institutions.
- Work with local CSOs, to acquaint them with the latest schemes and policies related to digital health and bridge the user-level digital divide to influence user-side adoption.

Case Study: Digital LifeCare's success in adoption at scale by acting on the recommended key addressable areas.

Description: Helps health worker screen, diagnose, manage and track Non-Communicable Diseases(NCD) at every level. Developed by Dell Technologies in collaboration with the government of India and a diverse ecosystem of partners, Digital LifeCare has **grown from 58,000** enrolled in late 2018 **to over 100 million today** (Dell Digital Life Care, n.d.).

28 States and UTs
75,000 Health Professionals
+100 million enrolled

Navigated the Policy and Regulatory Ecosystem

- Integrated with GoIs new health identity system.
- Partnered with institutes of repute such as AIIMS, DGHS, ICMR, NHSRC, NIC, CHI and iSpirt on technical and regulatory know-how.
- Developed capability to work with the central government on policy and planning like in a data privacy policy; and state and district officials on programme administration.

Strengthened Digital Infrastructure

- Partnered with MoHFW to strengthen the digital infrastructure on ground.
- Data collected is hosted by Government Data Center and managed by Centre for Health Informatics, MoHFW.

Tested solution in a structured environment

- Partnered with Karuna Trust, an implementing non-profit managing approximately 60 Primary Health Centres to pilot the solution.
- Iterated the solution on the basis of Karuna Trust's inputs from the ground.

Incentivised Adoption

- Partnered with Tata Trusts for support with implementation.
- Tata Trusts conducted training, and programme management activities to ensure technology adoption amongst health staff.

APPENDIX

List of solutions studied.

Healthcare Provider

E-arogya
doxper
Aushadhi
eSanjeevaniOPD
Piramal Swasthya
DRIEFCASE
argusoft
VerratonHealth
Bahmni
strand
ijr INDIAN JOINT REGISTRY
SRL Diagnostics
Raxa
NH Narayana Health
eka.care
Dr Lal PathLabs
Drucare
ALACARE
mfine
CrelioHealth
Apollo HOSPITALS
Marsha health
docon
mediXcel EMR
pieriandx
NIC eHospital
qure.ai

Citizen

mera adhikar
paytm
Co-WIN
Dr Lal PathLabs
JioHealthHub
DigiLocker
Aarogya Setu
mfine
practo
truemeds
doc prime
ULTRAHUMAN
KARKINOS
MediBuddy
ALACARE
Insurity
cure.fit
Plum
PharmEasy
BAJAJ FINSERV
DRIEFCASE

Sattva Analysis, List of ABDM integrated solutions as of 13.06.2022, Top 10 funded start-ups

Scoring Framework: Citizens

Steps Undertaken	The team downloaded the application to access the below-mentioned parameters.

Geography

Added locations based on population size to the app to check if the services are available in the region.

- **Rural**
- **Urban:** *Raipur, Rajkot Srinagar, Shillong, Siliguri, Nagpur, Vellore*
- **Metropolitan:** *Bangalore, Chennai, Delhi, Mumbai, Hyderabad, Kolkata*

Exception:
Telecommunication services are accessible from all locations.

Language

Check languages compatible with the application using language preferences.

- English
- Hindi
- Top 10 regional languages
- All Indian languages

Digital Literacy

Check service delivery models and user interface of the application.
High: High digital literacy required if the service is only available in the application mode.
Medium: Includes alternate service delivery models through WhatsApp chat or website link or has an easy-to-use interface.
Low: Physical modes of service delivery available such as walk-ins, or services available non·digitally such as through calls or messages.

Product Affordability

Mappings are relative and not absolute. Qualitative benchmarking on the range of services.

Teleconsultation:
- High:<100
- Medium: 100-300
- Low: >300

Lab tests:
- High:<500
- Medium: 500-2000
- Low: >2000

E-pharmacy convenience fee
- High:20
- Medium: 20-50
- Low: >50

Patient health records
- High: if they are free

Device Requirements

Accessibility of services based on the device type:
- Smartphone
- Feature phone
- IVRS or call

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Scoring Framework: Healthcare Providers

Steps Undertaken	The team connected with customer service providers to gain details on the application or leveraged the website testimonials/ partnership and secondary news articles to access the below mentioned parameters.

Geography

Areas of operation were determined by accessing the partner hospitals mentioned on the company's website.

In some cases, the type of support provided for the deployment of the solution was accessed to understand the applicability in regions:

- Such as, if the solution requires high reliability on the internet, and no pre-post installation or training is provided then the solution is not built for the rural hospitals.

Language

The language compatible with the platform:

- English
- Hindi
- Top 10 regional languages
- All languages

Exception: In some cases, only certain downloadable sections were present in Hindi, however, the application could only be used in English. In such cases, English has been considered the only compatible language.

Product Affordability

Mappings are relative and not absolute. Qualitative benchmarking on the range of services.

LMIS/HMIS (Lab/Hospital Management Information Systems):

- High: >50,000/month
- Medium:
- Low: <5000/month

PHR (Patient health records):

- High: >1000/month
- Medium: 0-1000/month
- Low: Free

Health tech:

- High: >20/prescription
- Medium: 0-20/prescription
- Low: Free

Internet dependence

Accessibility of the solution in online and offline modes:

- Only online.
- Offline and online.

Training

Most company websites mention the type of training provided. This was also confirmed by speaking with the customer care representatives:

- Type of training provided included pre-post installation, training sessions, and phone or video consultations.

Integration with insurance providers

Integration with private and public insurance providers:

- Public: Ayushman Bharat Insurance scheme.
- Private Insurance providers.

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