



Imagining Trillion Dollar Digital India

April 2018

About this report

Preview:

The Government of India is aiming to create a trillion dollar economy through Digital India campaign. Government departments are discussing a blueprint for getting there. The document titled 'India's Trillion Dollar Digital Opportunity' outlines a 30-point implementation module for creating up to \$1 trillion of digital revenue by 2022, and \$1 trillion of economic value from the digital economy by 2025.

The document presents a vision for how India's digital economy can unlock productivity and value – through transformative infrastructure, applications and ecosystems. It also outlines iconic 'Lighthouse Projects' that will have an impact on India in the digital arena, and how best to accelerate their implementation. The vision document identifies 30 'digital themes' under nine sections which are key to empowering the country.

Purpose of this report:

India is destined to become a trillion dollar digital economy in next few years. Close to a billion people will come under the digital ecosystem, making the scale and opportunity unprecedented anywhere else in the world. Many multi-billion dollar companies can be created out of India which will ride this wave of digital innovation. To prepare for next decade, a new generation of public and private digital infrastructure in the form of IndiaStack, GST, low-cost data etc. is coming together in India. This report offers investors, entrepreneurs and corporates with an overview of these digital building blocks. It is also an attempt to paint a qualitative and quantitative picture of opportunities that lie ahead for the India of next decade.

Report Outline

India is well on its way to become a trillion dollar digital economy

- Expanding digital **infrastructure** provides strong base for realizing a trillion dollar digital economy
- Rapidly growing heterogeneous **consumption** class is fueling digital demand
- Widespread adoption of emerging **technologies** is further driving digitization
- **Data explosion** owing to digitization and emergence of new sources of data is creating newer digital plays

Business ecosystems will come of age with evolving consumer needs and adoption patterns and digital reinvention of businesses

Significant opportunities will manifest across dimensions of platforms, data and experiences

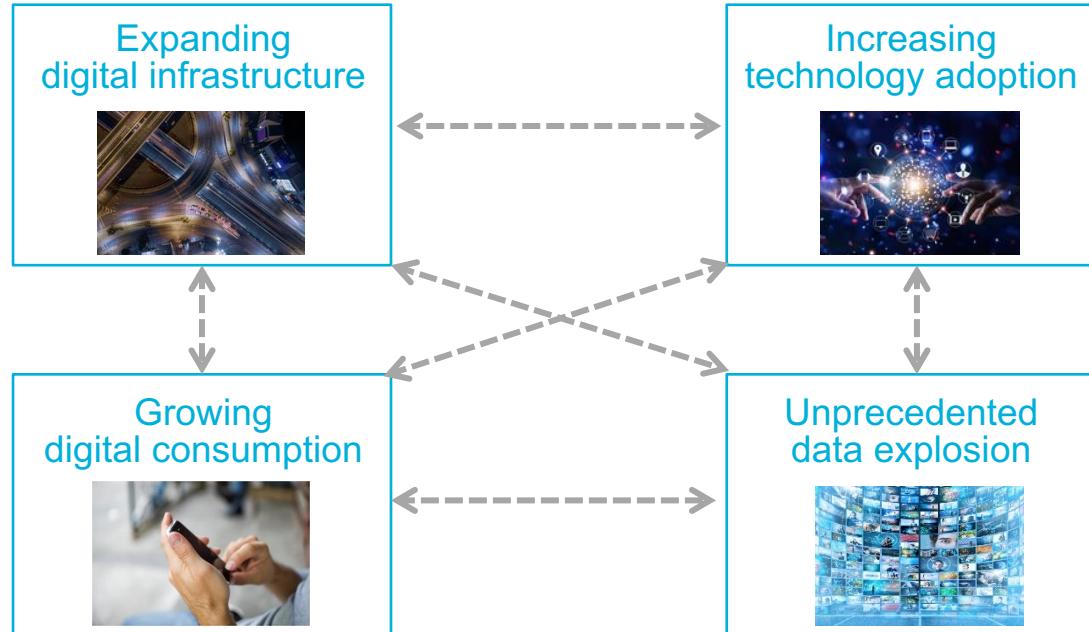
All sectors will participate with varying degree of adoption and impact on the digital economy

Organizations, startups and investors will need to gear up to seize these opportunities

Towards a trillion dollar digital economy

India is well on its way to become a trillion dollar digital economy

India is transforming towards a digital economy by an interplay of complementary levers



Evolving digital infrastructure provides a strong base for expanding digital initiatives

Increasing digital penetration along with public private initiatives are expanding India's digital infrastructure

Mobile, smartphone and internet penetration

J-A-M Trinity



736mn
Aadhaar-linked
bank accounts

1.2bn
Aadhaar
numbers

450mn
internet
users



~ 1.2 billion

'Go' edition (Android Oreo, YouTube Go) for 40-million low-end smartphone users

Telecom subscriber base, of which 1.16 billion are wireless subscribers

Public initiatives



Digital
Infrastructure as
a core utility
for all

Governance and
services on
demand

Digital
empowerment
of citizens

Private initiatives



High-speed fibre to the home (FTTH) broadband in more than 30 cities in 2018



Unified
payments
interface

Shared IT
infrastructure to
central and state
governments

National optical
fibre network to
all gram
panchayats

Foundations are already in place for a digitally inclusive economy

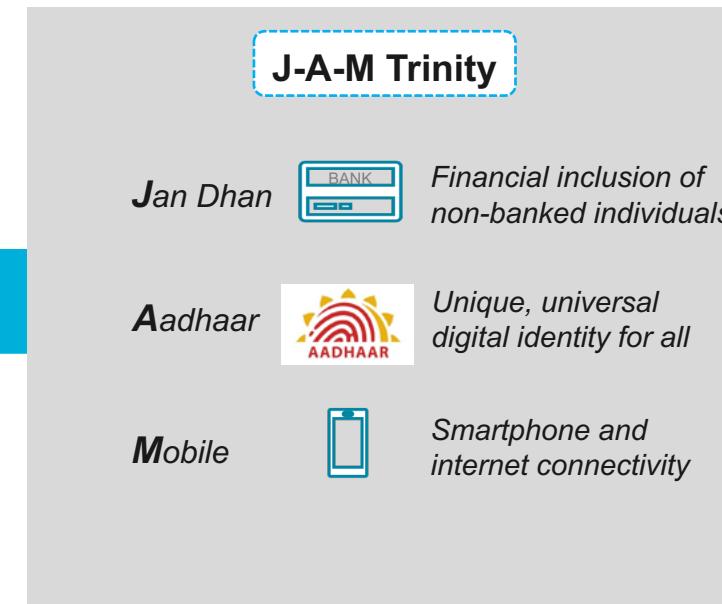
JAM Trinity constitutes the building blocks of India's digital economy

NOW:
Partly informal and
fragmented economy

736million
Aadhaar-linked bank accounts

1.2billion
Aadhaar numbers registered

450million
Internet users in India



2022:
Formal and
connected economy

~100%
Aadhaar-linked accounts

~100%
population to have Aadhaar

850million+
Internet users in India

Digital India initiatives are further boosting the country's digital development

Digital empowerment and financial inclusion of underserved population is the key focus



Pillars of Digital India: Digital for All

- Broadband Highways
- Universal Access to Mobile Connectivity
- Public Internet Access Program
- e-Kranti: e-Delivery of Services
- e-Governance
- Information for All
- Electronics Manufacturing
- IT for Jobs
- Early Harvest Programmes

2.5 Lakh

Common Services Centers (Digital Seva centers) in rural areas

19.3 Lakh

Users registered on MyGov platform

81 Lakh

Enrolments for Digital literacy program

Use case: Government's Aadhaar based direct benefit transfer program transfers subsidies directly to citizen accounts

Digital government services are acquainting masses with the power and convenience of digital



“...nearly one year of total subsidy payout has been saved by the government through DBT,”

- Top Indian government official

- DBT is being implemented in several welfare schemes across the country based on Aadhaar-enabled payments
- Under this scheme, subsidies are directly transferred into the Aadhaar-linked accounts of the beneficiaries
- This brings efficiency, effectiveness, transparency and accountability in the public distribution system



Saved more than INR 57k crore in 3 years after implementation

Fake beneficiaries and middlemen identified in the system

Public and private sectors are contributing in improving the vital internet infrastructure

Challenges faced by not-connected Indians are being addressed progressively



BharatNet: 'Broadband highways'

Internet connectivity to 2.5 lakh panchayats in the next 3 years
Over 1 lakh villages are service-ready



Digital Telangana: state initiative

Internet throughout the state via broadband and wireless technologies
2000 wireless links for state-wide coverage

Rural access



Last Mile

Quality



Low cost, high-speed internet

High-speed broadband in more than 30 cities in 2018
11x lower wireless 4G data costs



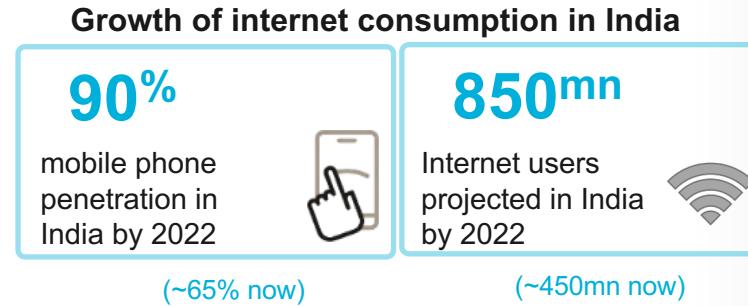
Tailored products for low-end devices

'Go' edition (Android Oreo, Youtube Go) for 40-million low-end smartphone users
400 free WiFi stations across the country

Extensive internet infrastructure will accelerate digital inclusion of ‘non-digital’ natives

Deeper digital penetration will contribute to country's economic development

By 2022, number of Indian internet users will double



- Half of all internet users will be rural
- 40% internet users will be women
- 65% of users will be more than 25 years of age

As per a World Economic Forum study,

2X rise in internet penetration can lead to

~12% increase

in per capita GDP growth

Businesses across industries will reap tremendous value from the growing digital infrastructure

Growing infrastructure will further accelerate digital transformation of businesses



Promotes digital inclusion of informal business sector

Centralized, digitized taxation system

Online registration & tax compliance

Shared IT infrastructure for central and state governments



Enables rapid rollout of digital payments facility

Unified digital payments technology

Example:

BijliPay, a payments solution provider, enabled Bharat-QR based PoS solutions for 12000 merchants in just 1 month



eKYC, eSign, DigiLocker, UPI



Reduced cost of service delivery

~80%

estimated reduction in costs of customer on-boarding



Easier to build and run faster

50k+

customers onboarded daily by Bharti Airtel using digital e-KYC



Reach masses efficiently

43%

fintech startups use Aadhaar for customer identification

Use case: IndiaStack eKYC, eSign enabled Jio to onboard over 20 million customers in just one month³

Forward-thinking organizations are already taking advantage of the digital infrastructure



“...Aadhaar enabled us to acquire a million customers a day, which is unheard of in the industry”

- Mukesh Ambani, CMD, Reliance Industries Ltd

- Reliance Jio is one of the newest and largest Indian telecom operators known for launching cheap 4G services
- It simplified customer on-boarding process through a revolutionary Aadhar-based eKYC solution
- Jio transformed its verification process from a highly friction-filled pain point to a seamless, friction-free experience



Record additions of 7 new members per second for several days
Reduced SIM card activation time from days to hours

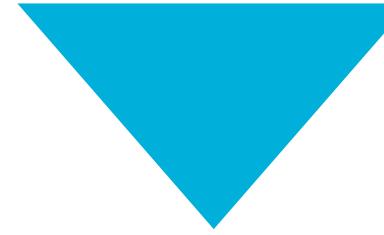
A robust digital infrastructure will enable India to have similar economic opportunities as other developed global economies

Digitization will help achieve sustainable and inclusive economic growth

For Citizens

Socio-economic inclusiveness

- Digitally-skilled individuals
- Better quality of life
- Access to better opportunities



For Businesses

Efficiency and innovation

- Economies of scale
- Access to underserved population
- Technological support

For the Government

Good governance

- Digital public services
- Increased transparency, reduced corruption
- Participative governance

Digital demand is also fueled by a rapidly growing heterogeneous consumption class

**Per capita GDP to grow ~3x
by 2025**

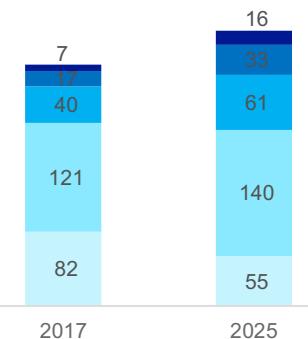
2017 **2025**

\$1710 \$4900
Per capita GDP Per capita GDP

\$1.3T \$2.7T
Total household Total household
consumption spend consumption spend

**Giving rise to large
consumption class**

**# of households by
income class**



- Elite (>\$30,800)
- Affluent (\$15,400 - \$30,800)
- Aspirers (\$7,700 - \$15,400)
- Next Billion (\$2,300 - \$7,000)
- Struggler (<\$2,300)

**With distinct digital drivers and habits
across income segments**

	Drivers	Access & Footprint	Language
Elite & Affluent	Convenience & Lifestyle Strong brand affinities	High end smartphones, Laptops AR/VR Plethora of Apps	English
Aspirers	Better quality of life Value conscious & limited brand loyalty	Budget Smartphones Few apps, dominant mobile web	English to perform transactions Vernacular for content consumption
Next Billion	Basic access Extremely price sensitive	Sub \$50 Smartphones (<1GB memory) Messaging, Voice, Super apps	Vernacular

Consumer will be at the center stage of India's trillion dollar digital economy aspirations

Rising
Consumption

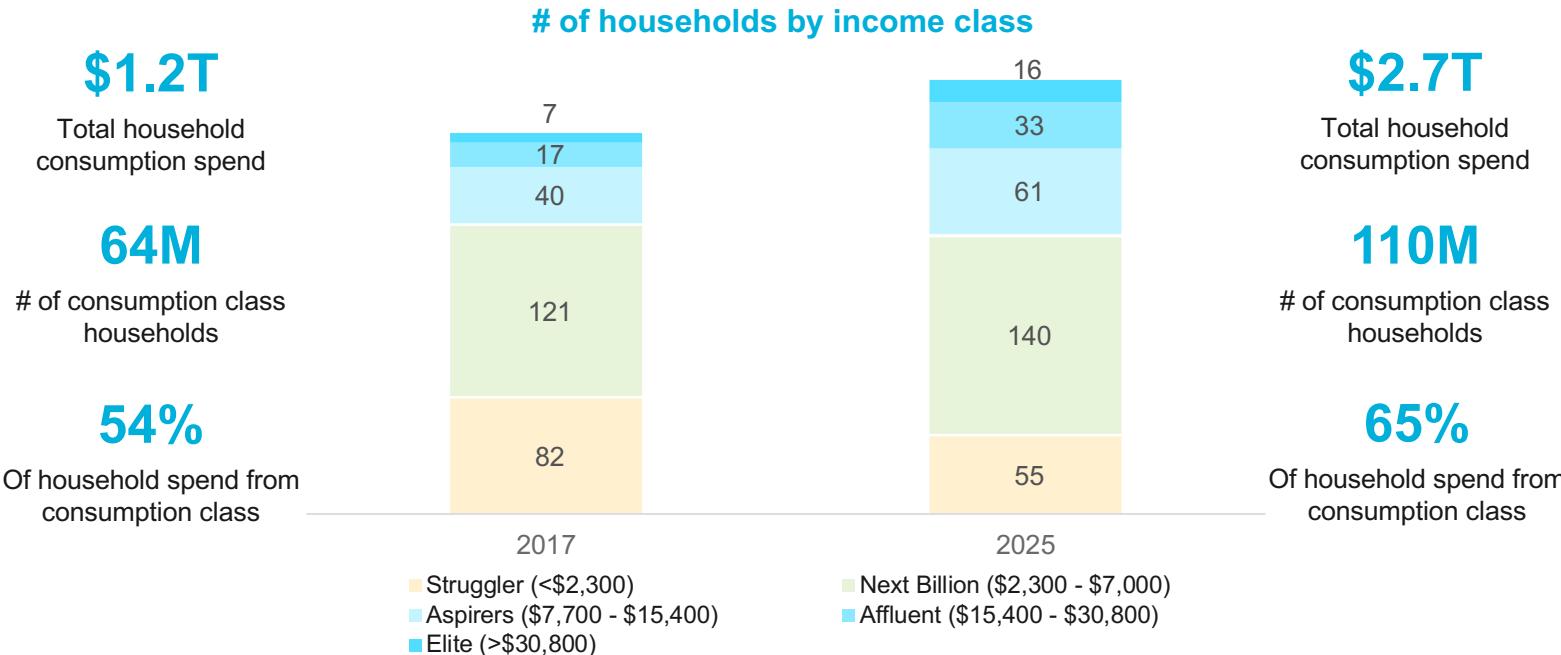


+

Mass Scale
Digital Adoption

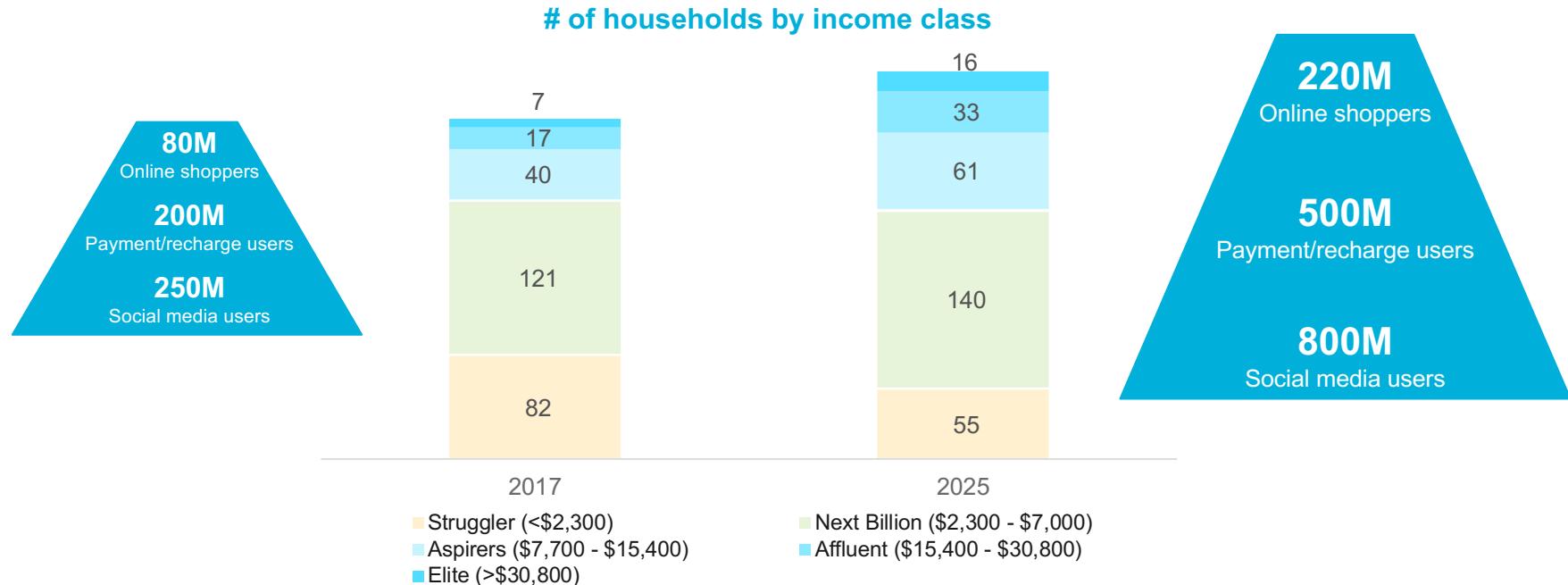


Household consumption to more than double by 2025



Source: BCG Report : The New Indian: The Many Facets of a Changing Consumer

Digital adoption across income classes will present massive digital consumer opportunity



Source: BCG Report : The New Indian: The Many Facets of a Changing Consumer, Kalaari Estimates

Digital drivers and behavior will vary across different income segments

Affluent 49M Households		Aspiring 61M Households	Next Billion 140M Households
			
Need	Convenience & Lifestyle	Better quality of life	Access
Access	High end smartphones High end Laptops AR/VR technologies	Budget Smartphones Laptops	Sub \$50 Smartphones (<1GB memory)
Language	English	English to perform transactions Vernacular for content consumption	Vernacular
Loyalty	Strong brand affinities	Value conscious & limited brand loyalty	Extremely price sensitive
Footprint	Plethora of apps and websites across commerce, social media, & content	Limited mobile apps due to low storage Dominant mobile-web	Dominated by messaging platforms & super-apps

Digital behavior of middle of the pyramid will require players to innovate



App Distribution and Retention

E-mail id based play store sign-up

But many of them don't have email ids

Bluetooth based P2P file transfer like ShareIt driving lot of app downloads

.. But OTA (Over the air) upgrades are challenging

Low memory phones

Most users have 4/8GB memory phone

~70% memory used by OS and media

Space for only 6-8 3rd party apps. 2-3 apps will be social media and entertainment

..90 days uninstall rate is as high as 80%



Language and dialect diversity

- 22 major languages and 720 dialects

- And they hardly use pure form of language

 - As per the research, 1 in every 6 word used by a Hindi speaking person is English

Pure Hindi

“क्या आपने संदेश पढ़ा है?”

Most users say

“क्या आपने message पढ़ा है?”

- Vernacular keyboards are clumsy and complicated

 - English has only 26 keys
 - Hindi - 51 keys, Bengali – 72 keys, Telugu - 79 keys

Makes a strong case of Mobile Web and Super apps (All-in-one apps)

Source: IDC, Western Digital

Voice first approach will be key to address the language complexity

One solution for all approach will not be able to cater to the diversity of consumer needs and digital behavior

Large digital platforms



Illustrative

Will evolve into ecosystems of offerings targeted specific consumer segments and needs



Specialized digital players



Will target micro market opportunities
Capture specific consumer segments by creating deep solutions

Widespread adoption of emerging technologies is further driving digitization

Increase in technology adoption is driven by maturity, digitization, accessibility, and digital talent

Rapidly maturing emerging tech. being harnessed...

HDFC Bank uses social media **analytics** to offer credit cards to customers

26% CAGR growth in Big Data Analytics market (2017-2022)

Increasing focus on digitization...

85% Indian CEOs plan to invest in IoT over the next three years

971 IoT startups in India

Easy accessibility across demographics...

500K WiFi hotspots in rural areas as per Budget 2018

Low cost smartphones by Reliance

30% of digital content is in regional languages

18% growth in Indian language users on internet

Indian digital talent available...

70% of global CXOs consider Indian global-in-house centers (GIC) a critical player

35% of overall hiring today is for digital technology skills

GICs aiming to excel at **Automation, Analytics**

Data Science, one of the most sought after career options in India

Rapidly maturing emerging tech. being harnessed by Indian companies resulting in growth in emerging tech. market



Using **ML** to make recommendations and detect frauds



Leveraging **Analytics** to improve matching rates and minimize deviations



Disrupting supply chain financing using **Blockchain**



IDFC Bank's unique **AI** powered Equity Fund



IoT market growing at **41%** (2017-2020)



Big Data Analytics industry growing at **26%** (2017-2022)



Industrial Robotics market growing at **9.6%** (2017-2023)



Cyber Security market growing at **11%** (2017-2022)



Cloud market exp. to grow at **22%** (2017-2020)



AR/ VR market exp. to grow at **76%** (2017-2022)

The above numbers are growth rates in CAGR

Indian CEOs increased focus on digitization, in sync with an increasingly digital world, is giving a push to tech startups

Growing focus of Indian companies to digitize operations and embrace new technologies...

85% Indian CEOs plan to invest in IoT over the next three years

63% plan to make substantial investments towards **emerging technologies** in the coming years

85% doing high investment towards **data analytics** tools to create differentiation

81% of Indian CEOs stated that it is important to have **digital skills**

...leading to growth of tech startups

600 Data Analytics firms in India

75% growth in AI focused start-ups

170 AR and VR startups in India

971 IoT startups in India

Low cost mobiles and easy internet accessibility leading to a rise in the number of internet users and regional digital content



androidone

- Reliance Jio offering **4G smartphones** running on Android
- Android One launched to provide Android experiences to **low cost smartphones**



- **500K WiFi hotspots** in rural areas as per Budget 2018
- **High-speed fibre to the home** (FTTH) broadband in more than 30 cities in 2018

18% growth in Indian-language users on internet

Google Translate offers **translations** between English and nine widely used Indian languages

OTTs using **AI, Analytics** for better content recommendation

850+ mn internet users in India (by 2022)

70% of Indians consider local language digital content more reliable than English content

Indian GICs increase their focus towards digital technologies to meet the demand of global companies

800,000

employees are employed by about 1,100 GICs in India

70%

of global CXOs believe that the Indian IT/ ITes global-in-house centers (GICs) will play an active role in the digital age

- GICs aiming to excel at **Automation, Analytics** in line with Global CXOs requirements
- **70%** of large IT services companies and GICs hire for positions requiring **digital skills** every quarter
- **56%** of all **analytics demand** is coming from Captive centers in India
- Indian GICs leveraging **RPA** to improve the effectiveness of transactional activities

Universities are catering to the rising demand for leading technology roles by offering relevant courses and trainings

Shift in technology roles...

35% of overall hiring today is for **digital technology** skills

~2 million people to work on **next-gen technologies** in the next 5 years

Demand for **AI and ML** is expected to see a **60% rise** in 2018

42% rise in **analytics** jobs in BFSI sector

Number of **analytics** jobs **doubled** in the last 1 year

India ranks 2nd, just after the US, in Big Data talent availability and service provider's initiatives to build talent - Nasscom-Crisil

...being met by newer courses by colleges

All of the top 20 Indian institutes such as IITs, IIMs are offering **analytics courses**

4X YoY growth in enrolments in **ML** courses – IIT Kharagpur professor

Data Science is one of the most sought after career option today among students

Colleges offering certification, weekend, online courses on **AI, ML, Data Science** to suit professionals with different requirements

Data explosion owing to digitization and emergence of new sources of data is creating newer digital plays

As digitization evolves, new digital plays will come up to leverage the data that gets generated

Digitization of traditional businesses

15%

Rise in enterprise software spending from 2017 to 2018

30%

annual growth in ecommerce industry for the next 5 years

New sources of data

10 x

More digital payments by 2022

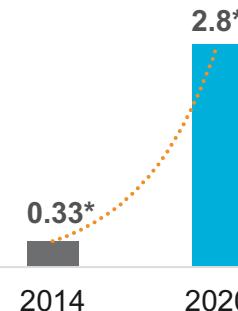
32 x

More IoT connected units by 2022

450 Mn

online video audience by 2020

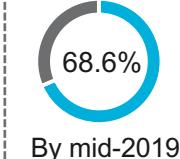
Indian digital universe to grow to 2.8ZB by 2020



*figures in zettabytes

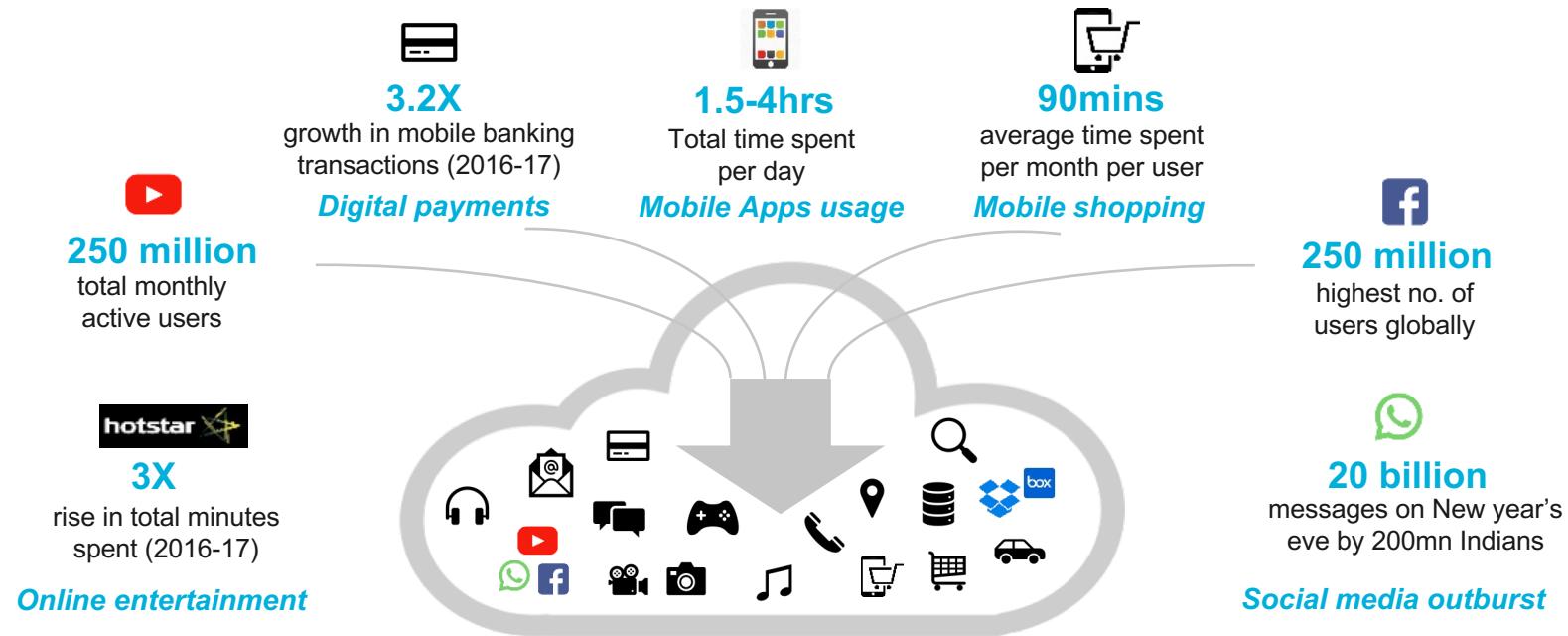
Big **data analytics** sector in India to **grow 8 times** by 2025

AI adoption to go up by more than **200%** by 2019



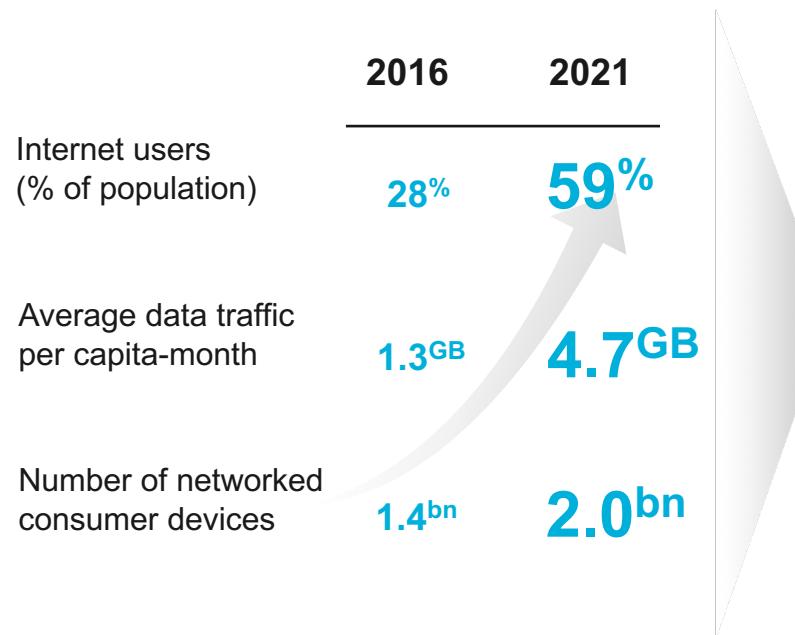
Digitally-enabled Indians are consuming and generating enormous volume of digital data everyday

Falling data costs in India is accelerating digital consumption across all socio economic sections



As internet reach widens and usage increases, consumer behavior will further evolve digitally

Increasing internet usage is leading to a steady shift in the way consumers behave

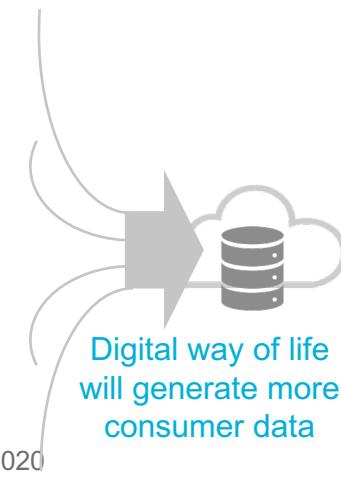


New ways of entertainment & media
450 million size of online video audience by 2020

Digital consumer spending to increase
2.5X rise in digital spending to reach \$100bn by 2020

Monetary transactions to go digital
Digital payments likely to supersede cash by 2022

Digital-driven FMCG consumption
40% of FMCG consumption will be driven digitally by 2020



Digitization of traditional businesses and rise of digital startups will contribute to influx of data

Digital businesses tend to be more data-intensive

Traditional businesses are adopting digital

30%

CAGR growth in ecommerce market (2016-20)
(~\$100bn size by 2020)



15%

rise in enterprise software spending (2017-18)
(compared to 9% globally)

2X

growth in public cloud services market (2017-20)
(\$1.9 Billion in 2017)

~1.4X

rise in industrial automation market (2017-20)
(CAGR of 11.6%)

Digital startups are growing in numbers

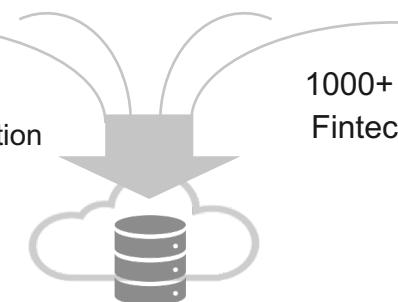
3rd largest startup ecosystem globally, after US & UK

~5200

tech startups in 2017

10,500

tech startups by 2020



1000+ new tech startups added in 2017

Fintech and health-tech saw maximum rise

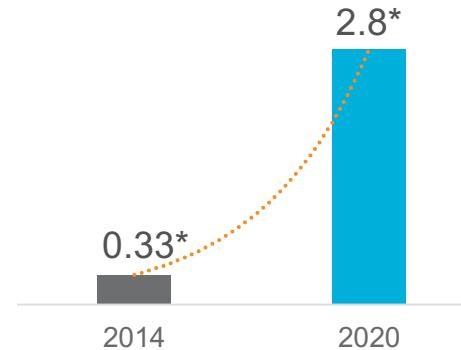
31%

28%

(% growth in startup base in 2017)

As digitization evolves, data supply will soar exponentially in both volume and types of data

New digital plays will come up that will leverage the available wealth of data



Indian digital universe to grow to 2.8ZB by 2020

*figures in zettabytes

Huge demand for data curation services and AI

80% of enterprise data will be unstructured, by 2022

8X
growth in **big data analytics** sector by 2025
(\$16bn size in 2025)

Cognitive technologies and AI will be in demand

200%
rise in **adoption of AI** by enterprises by 2019
(~70% enterprises to use AI)

Digital reinvention of businesses

Business ecosystems will come of age with evolving consumer needs / adoption patterns and digital reinvention of businesses

As consumers become increasingly digital, businesses will focus on digital reinvention of their organizations

Digitaly empowered consumers

By 2025

60%

of India's population will have smartphone and fast & reliable data connectivity

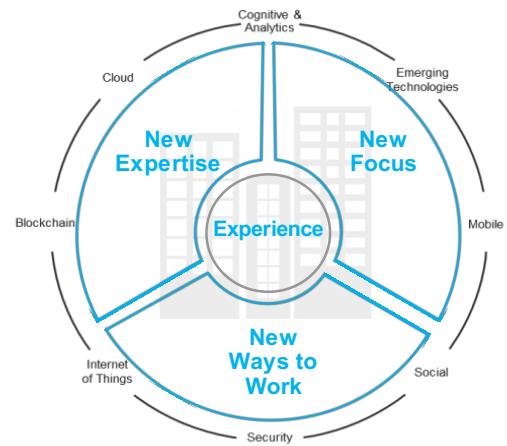
450mn

of India's buyers will be digitally influenced

18GB

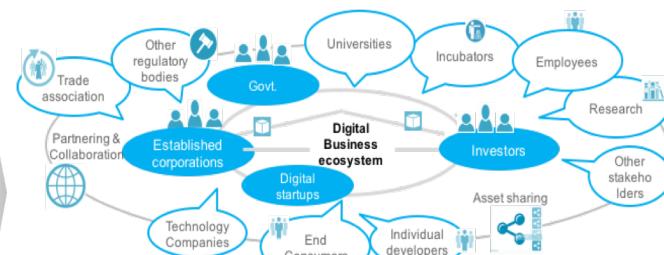
Data consumption per internet user

Digitaly reinvented businesses



Organizations embrace a new focus, founded on new expertise and new ways of working

Digital ecosystems



Favorable Business ecosystems
2X rise in number of tech startups by 2020

Improved ease of doing business
Target of getting into top 50 rankings

Digital businesses, consumers and technologies will evolve and create new digital business ecosystems

Business ecosystems are changing and will continue to evolve digitally...

Retail ecosystem is changing..

Organized retail/
mom and pop shops



Entertainment ecosystem is changing...



Healthcare ecosystem is changing...



In a developed digital economy,

- Platform- and network-based business models will continue to evolve



- Sector boundaries will be blurred by industry convergence

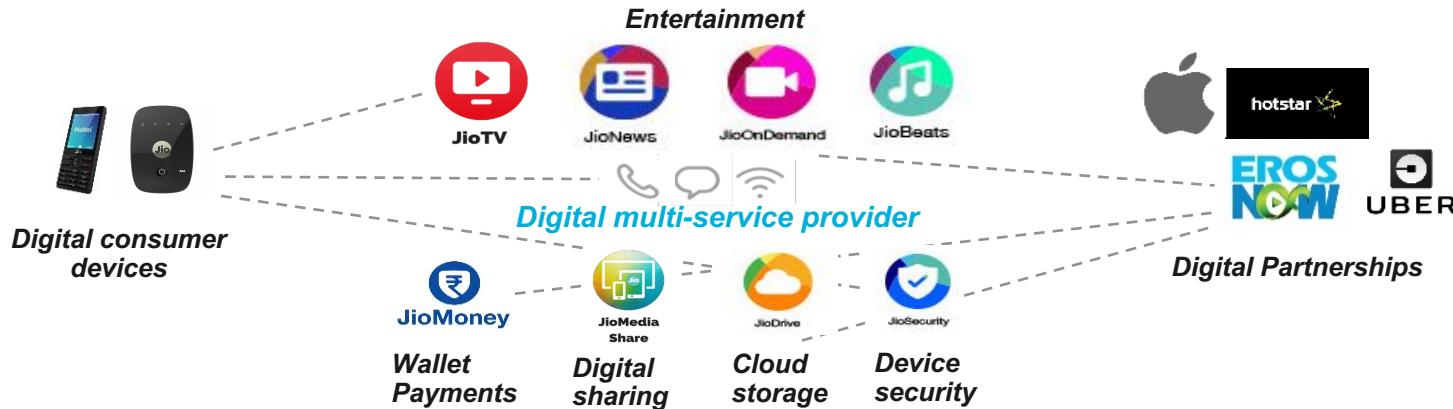


- Digital innovation will emerge at the intersection of advanced technologies



Upcoming digital ‘multi-service provider’ models have the potential to create disruption across industries

Example: Jio built an expansive array of digital services, products and innovative partnerships



Changing competitive patterns in digital business ecosystems

- Extensive opportunities of business expansion and data monetization for digital companies
- Digital business models will reap greater benefits from positive network effects than non-digital models
- Platform- and Subscription-based models will be the norm
- Non-digital businesses will find it difficult to diversify in advanced digitally economy

Digital disruptions are fundamentally changing the business economics

Constantly shifting business dynamics is leading to formation of digital ecosystems

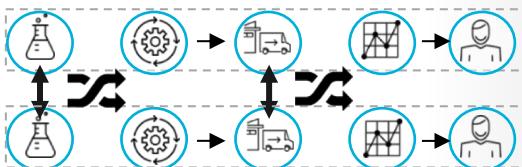
Fragmentation of traditional value chains

New technologies create more transparent value chains that are easier to decompose functionally



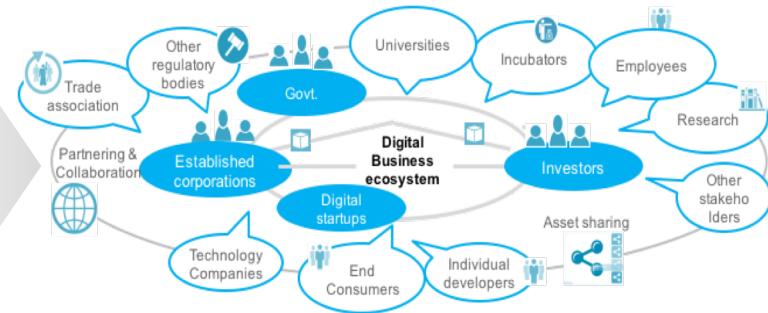
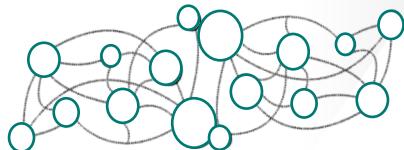
Convergence of traditional industries

New competitors are emerging that compete in specific value chain functions across industries—driving industry convergence



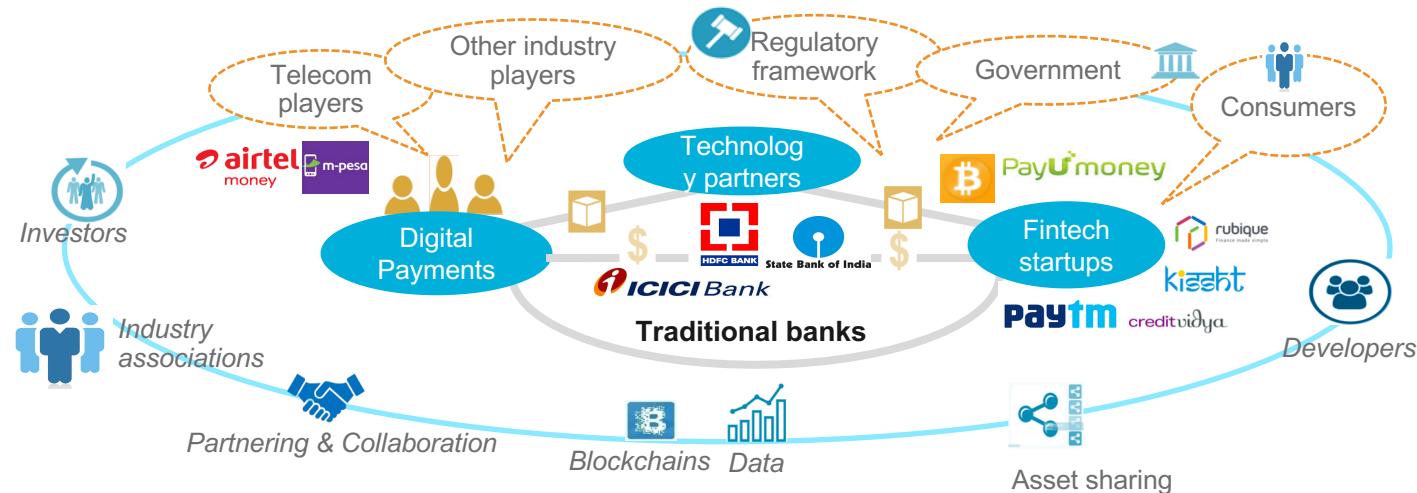
Emergence of new ecosystems

New types of ecosystems emerge, displacing traditional industries and underpin evolution of seamless sophisticated customer experiences



Sources: IBM Institute for Business Value – Digital Reinvention in Action

Example: India's banking ecosystem is rapidly evolving into a network of multi-dimensional relations with joint interests



Value creation in banking ecosystem

- Expands customer base into unbanked and under-banked populations
- Promotes increased efficiency through easier, more convenient specialization and partnering
- Expands services offered by banks, borne from the innovation of fintech partners

Sources: IBM Institute for Business Value – Entrepreneurial India report

Traditional banks have been impacted by unparalleled disruption and compelled to digitize

Digital disruption in Indian banking landscape

Innovative fintechs



Fintechs in various areas like payments, lending, AI, security, etc. are redefining the way Indian banks, businesses, customers interact and transact

New payment methods



Emergence of mobile wallets, third-party payment platforms and cryptocurrency are revolutionizing payments in India

Mobile-only banks



Fully digital banks with no physical branches, no paper-work and signatures are setting a new trend for the tech-savvy youth

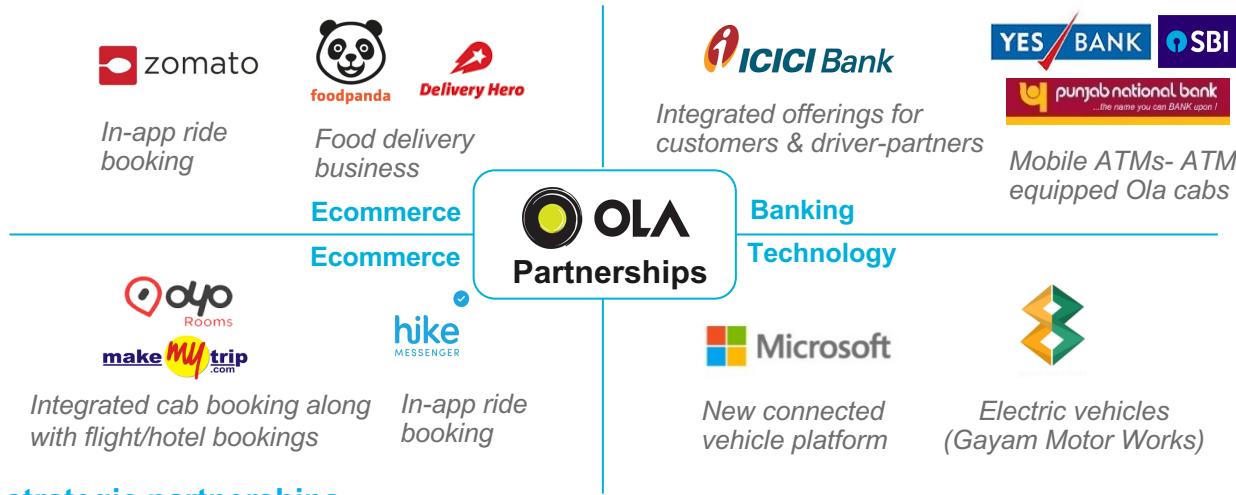
Industry convergence



Players from industries like telecommunications have already made their mark in the Indian banking ecosystem

Digital is facilitating evolution of cross-industry ecosystems through innovative partnerships / platforms

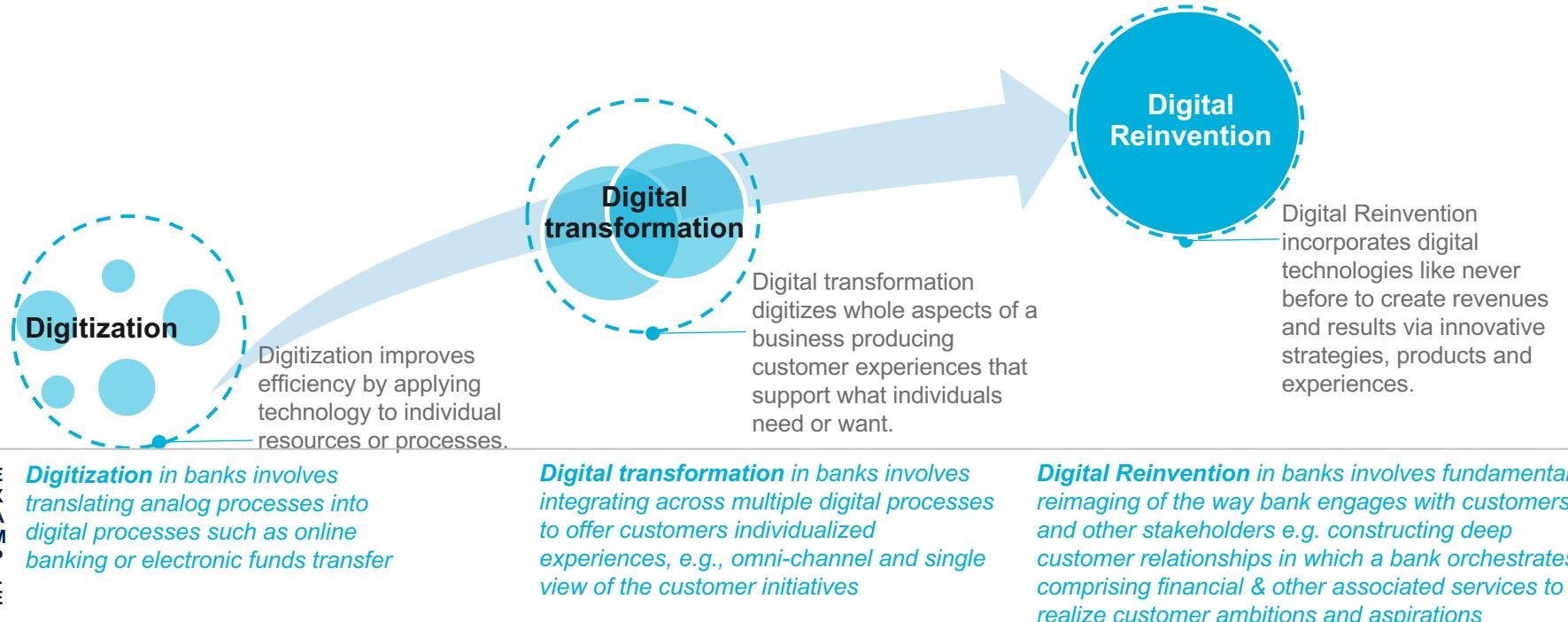
Example: Ola has strategically collaborated with diverse partners to expand and innovate its business



Value creation from strategic partnerships

- Expanded customer base and scalability into new businesses and markets
- Improved passenger and driver-partner experience by providing integrated and complementary offerings
- Co-innovation with technology partners to build cutting-edge digital solutions for vehicles

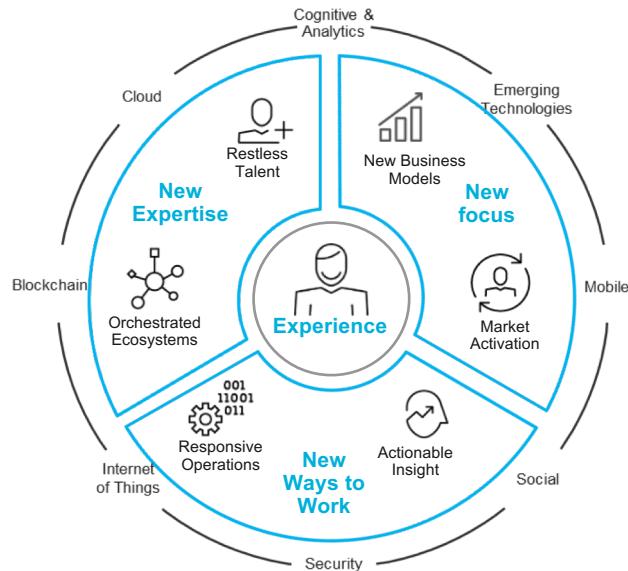
To thrive in the face of increasing digital led disruption, organizations require Digital Reinvention



Sources: IBM Institute for Business Value – Digital Reinvention in Action

Digital Reinvention supports new experiences through new focus, new expertise and new ways of working

Digital Reinvention enables and supports deep, compelling experiences



Embrace digital drivers

New focus

- Advanced data analytics across organization
- New business models

New expertise

- Right talent for an agile and innovative organization
- Active participation in ecosystems

New ways to work

- Digitized product, services and processes across organization
- Design driven innovation

Sources: IBM Institute for Business Value – Digital Reinvention in Action

Significant opportunities will manifest

Opportunities will manifest across axes of platforms, data and experiences



Platform axis: innovative digital platforms will emerge and expand the planet of opportunities for businesses

Platforms will act as intermediaries broadening prospects on both supply and demand sides

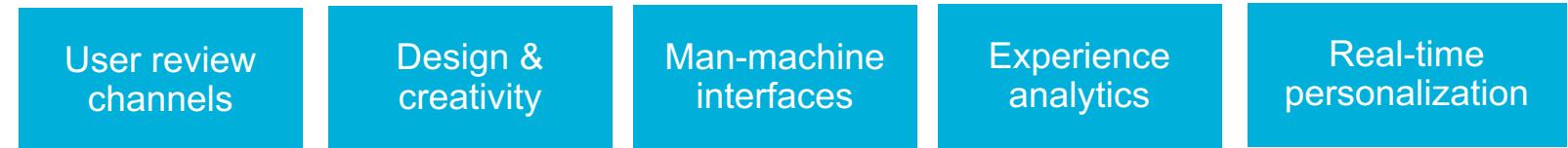


Scope of Opportunities

- For everyone to create new digital platforms around industries or domains
- For providers to plug into existing platforms and expand their footprints
- For consumers to access goods, services, knowledge or opportunities on-demand

Experience axis: creating unique customer experiences via digital will become the key differentiator for businesses

Customer-centricity will give rise to diverse opportunities in the space of experience enhancement



zomato



Scope of Opportunities

- For businesses to generate revenue out of customized services
- For tech experts to innovate in the space of robotics and improve human-bot interactions
- For innovators to offer creative ideation services for experience enhancement

Data axis: value that can be derived from big data will offer significant opportunities across business ecosystems

Data experts will witness opportunities to play with big data and offer structured insights

Data curation services

Data handling tools

Data-driven automation

Niche data sets

Consumer insights



Scope of Opportunities

- For existing businesses to create data (using IoT) and monetize data
- For experts to offer data organization and analysis services/ tools to organizations owning data
- For innovators to generate/ gather new valuable data sets which are unavailable today

Businesses across industries will look to realize opportunities that become available in a digital economy

How will the digitally advanced business ecosystem be different from today's?

New competitive factors

Competitive use of technology and real-time data will determine who wins or loses

New ways of working

Mobile employees, cross-enterprise collaboration, digital networks and fully-online enterprise products will be a norm

New focus

With back-office automation coming to saturation, next focus will be all about revolutionizing the front-office

New business models

Growing influence of on-demand, real-time and emerging technologies will influence even industries like oil & gas, construction to go digital

- **Enterprise software market** will move from legacy solutions like ERP, CRM to advanced front-office solutions
- **E-commerce market** will grow to include all kinds of non-conventional products and services on-demand
- **Digital startups** will define entirely new ways of work, products, platforms, business models and technology
- **Innovation-focused startups** will have good chances of becoming billion-dollar enterprises in the digital economy
- **R&D units, startups and innovators** will play an important role in digitizing the physical industries
- **India-born innovations** will be acknowledged and adopted globally – Aadhaar, low-cost electric vehicles, etc.

Use case: Paytm adopts presence-less, paperless and cashless layers of India Stack to offer cost-effective digital banking

Digitally-focused startups are tackling incumbents to become billion-dollar enterprises



"This will allow us to offer cost-effective services to Indians and bring us closer to our goal of bringing half a billion Indians to the mainstream economy"

- Vijay Shekhar Sharma, Founder - CEO, Paytm

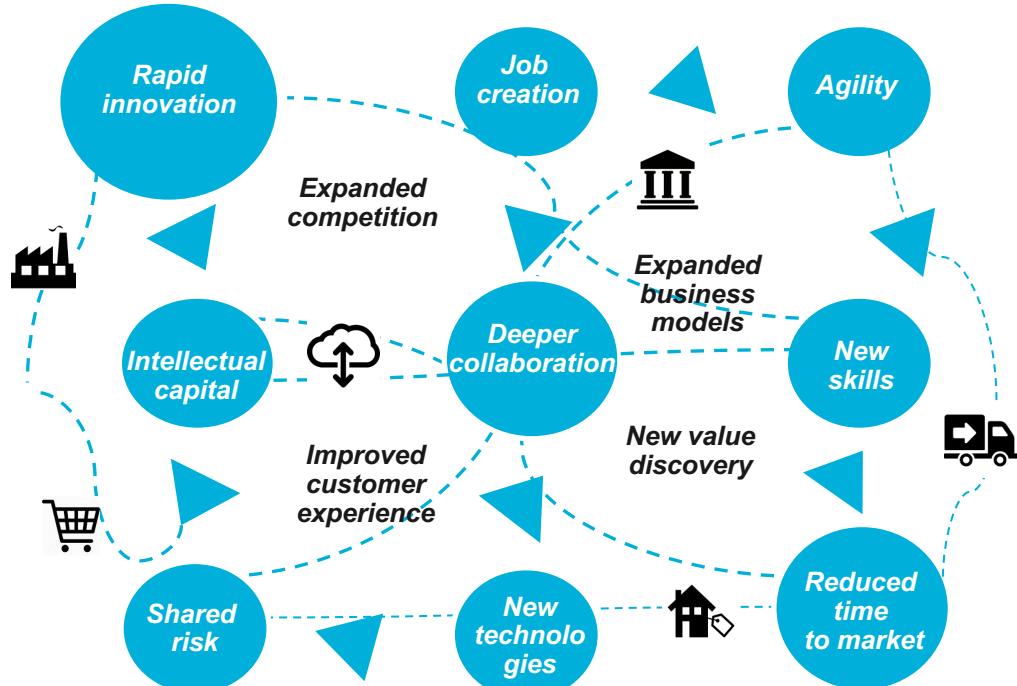
- Paytm, a mobile wallet major with over 160 million users, launched its Payments Bank
- Implemented Aadhaar authentication, eKYC, eSign, DigiLocker, UPI for their services²
- Paytm's UPI interface allows money exchange through any UPI-enabled app



Huge scalability and inter-operability for its solutions

Enhanced experience for customers and merchants

Immense opportunities that become available in a strong digital economy will further drive continuous innovation and disruption



5 key benefits of a digital economy:

Increased transparency

Organizations will become more transparent and flexible to adopt new technologies

Higher value added services

Startup ecosystems will have innumerable opportunities from data explosion

Improved competition

Businesses will expand globally due to improved global competitiveness

Expansion and deeper skills

India will develop and leverage the world's largest digitally enabled workforce

More liquid capital

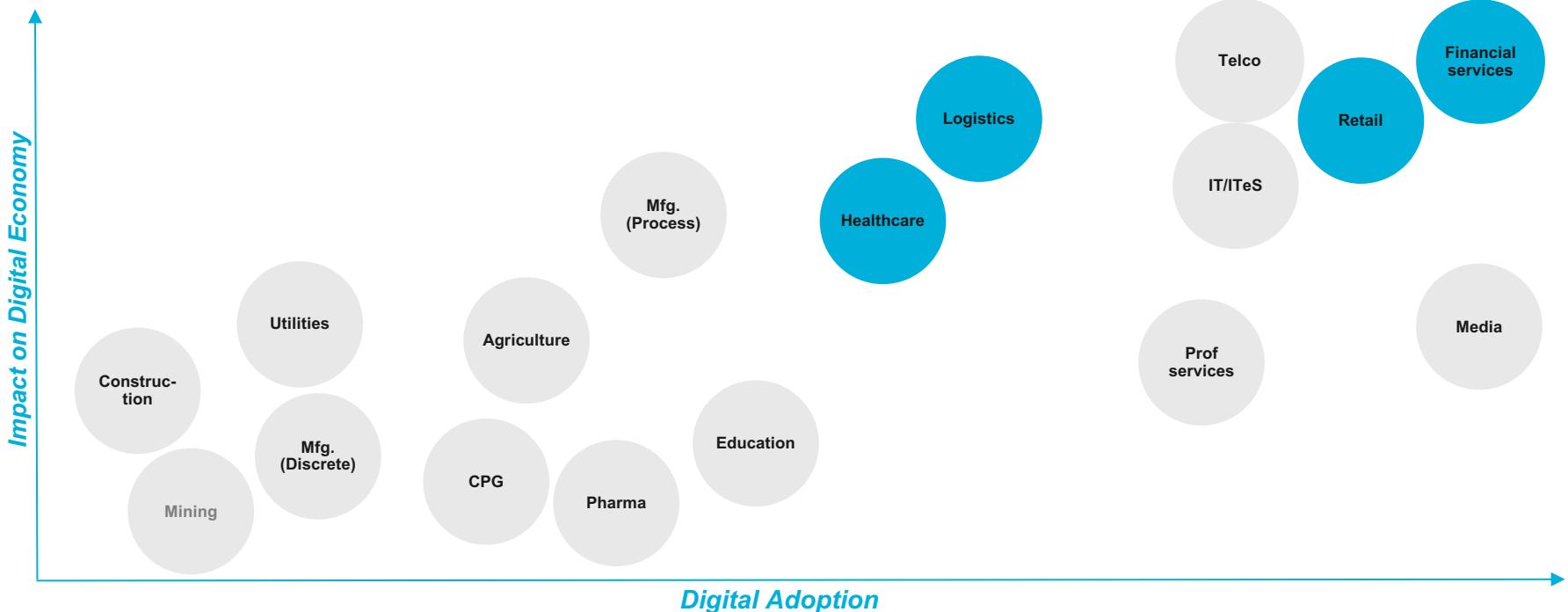
Businesses, startups, investors and other stakeholders will be able to create more wealth

Sources: IBM Institute for Business Value – Entrepreneurial India report

Impact on key sectors

Financial services, Logistics, Healthcare, Retail

All sectors will participate with varying degree of adoption and impact on the digital economy



Impact on key sectors

Financial services, Logistics, Healthcare, Retail

Product innovations will drive mass penetration of Financial services

Highly underserved consumers and SMEs

13%

Consumer credit to GDP
(USA: 80% |
China: 40%)

17%

Of households (40-50M) at top of income pyramid consume 90% of consumer credit

10%

Of SMEs (5M) avail any form of formal credit

High cost & lack of data preventing mass penetration

INR 2500

Average cost of originating and servicing personal loan

Making it unviable to give small ticket size (e.g. 25,000) consumer loan

85%

Of SMEs have no form of digital data footprint

Making credit risk assessment a very manual and time taking process

New digital infrastructure will bring paradigm shift

New digital infrastructure in the form of IndiaStack – Aadhaar, eKYC, eSign – and GSTN presents a once in a lifetime opportunity to reimagine process flows and products

80%

Reduction in time taken in consumer onboarding

3B

Invoices p.m. on GSTN build underwriting models for SMEs

10c

Flat cost of a UPI transaction

Driving product innovation for mass penetration

Mobile-first Data-led Innovation

New bite sized consumer products addressing specific needs of households at the middle of the pyramid



Proliferation of products addressing different SME needs



Equipment
Financing

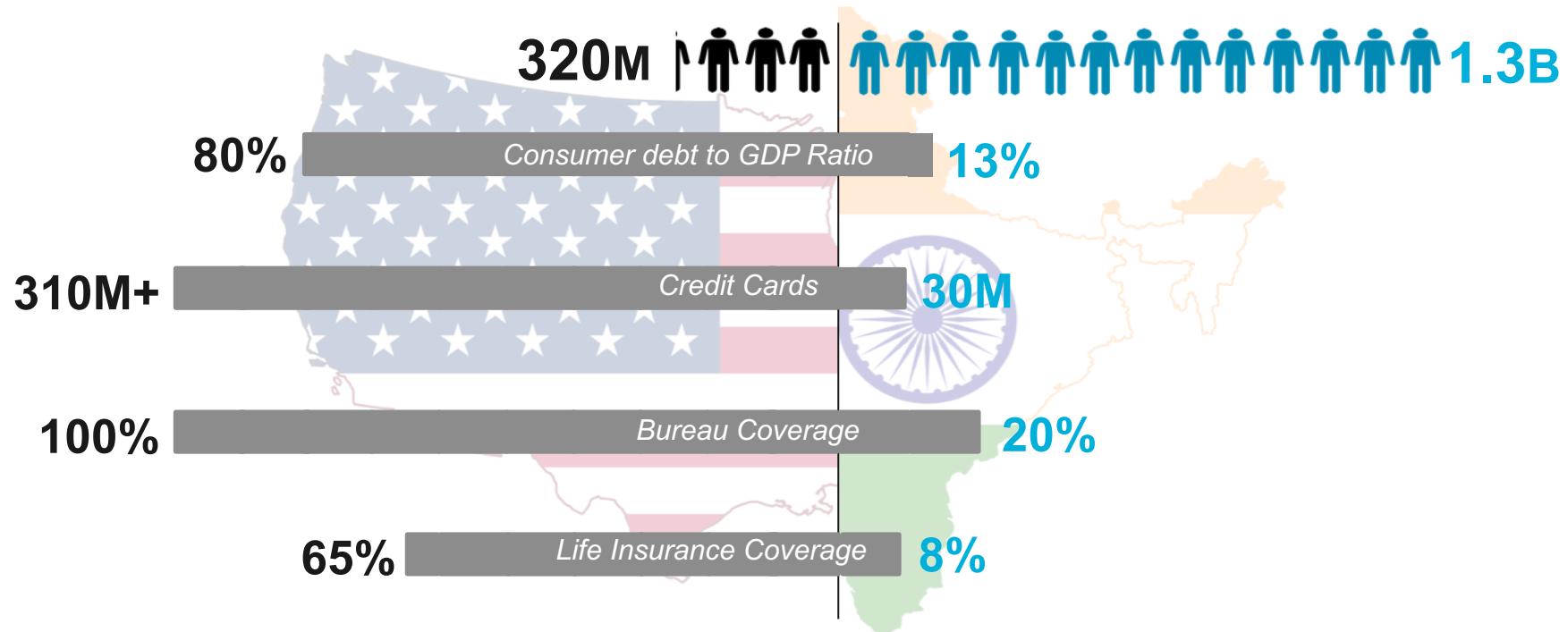


Invoice
Financing



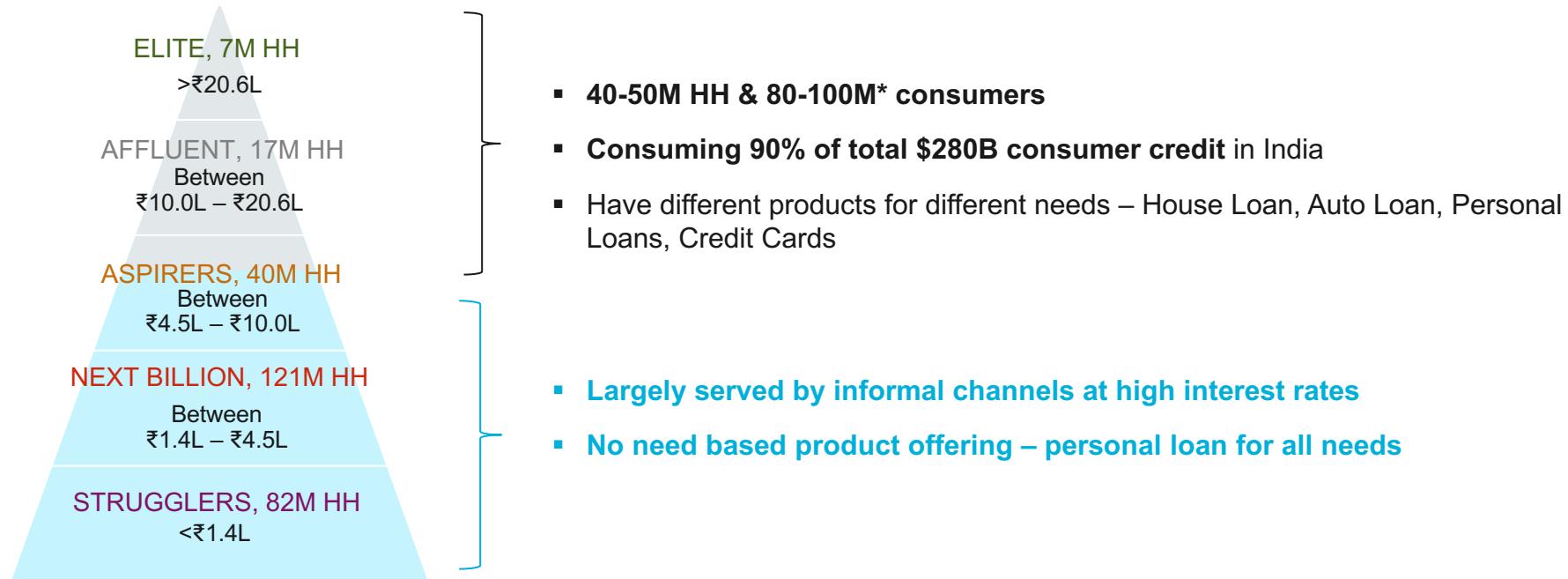
Merchant
Cash Advance

Consumer financial services in India are underserved



Source: RBI | World Bank | Kalaari Estimates

They are geared towards people at the top of the income pyramid



Source: BCG Income Pyramid 2016 | *2 Consumers per HH

High costs have prevented mass penetration



Current average size of personal loan for banks is 2,00,000

1.25% of INR 2,00,000 Loan

7.2% of INR 35,000 Loan

This cost escalates even more as one goes down the income pyramid

But an eligibility of an average middle-class Indian earning 15,000 per month is ~35,000

Large financial institutions have stayed away from small ticket size loans due to prohibitive cost structure

Rapidly changing digital infrastructure and regulatory framework

Digital infrastructure is ramping up

1.2B

Aadhaar cards issued since 2009

736M

Aadhaar linked Bank Accounts

80M

Monthly UPI transactions

Regulatory Impetus towards digital

Aadhar based eKYC & eSign; Digitlocker; and Digital consent architecture will significantly bring down the risk

3B

Aadhaar based identifications done

150M

eKYCs done

Paradigm shift in cost

80%

Reduction in time taken to onboard customers

10c

Flat cost of UPI transaction as compared with cost being as high as 2% of the transaction value

Will lead to explosion of new products and services geared towards middle of the pyramid

110M

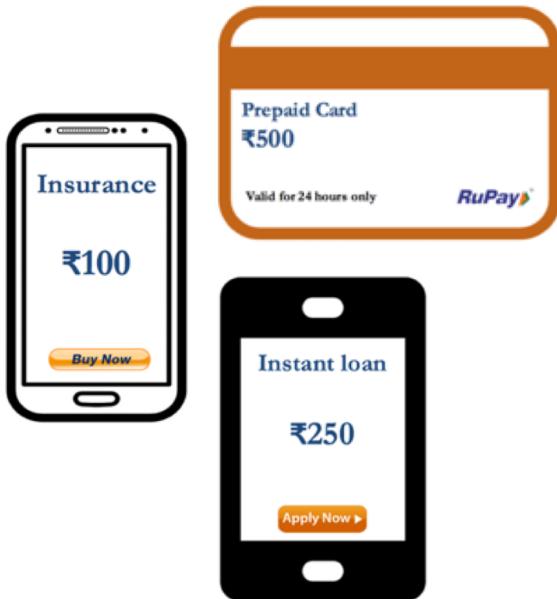
New households

225M

New consumers

Low cost and unit consumption products will emerge to serve the needs of middle of the pyramid

New age Fintech players will lead this product innovation



Digitization will bring new data on the new consumers

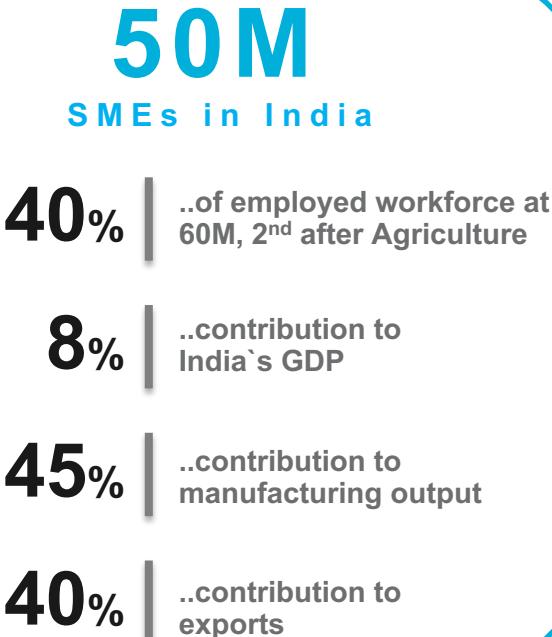


Offering will be Mobile-first

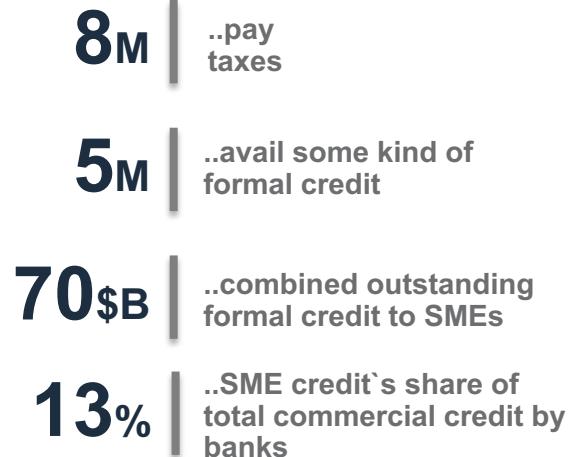


Products for specific needs – wedding loans, two wheeler loans, healthcare loans etc.

Financial services have been the main bottleneck in the growth of SME sector



..are financially underleveraged



Source: RBI | Kalaari Estimates

Lack of data and large transaction costs have prevented SMEs leverage informal sector

SME economy
is primarily
cash based



High cost of
processing loans



Lack of
organized data
to underwrite



Lack of
product
innovation



GST will be big driver for the SME sector



Digitisation will enable proliferation of products to enable SME finance



Term Loan



Equipment Financing



Invoice Financing



Corporate Cards



Short Term
Loan



Line of Credit

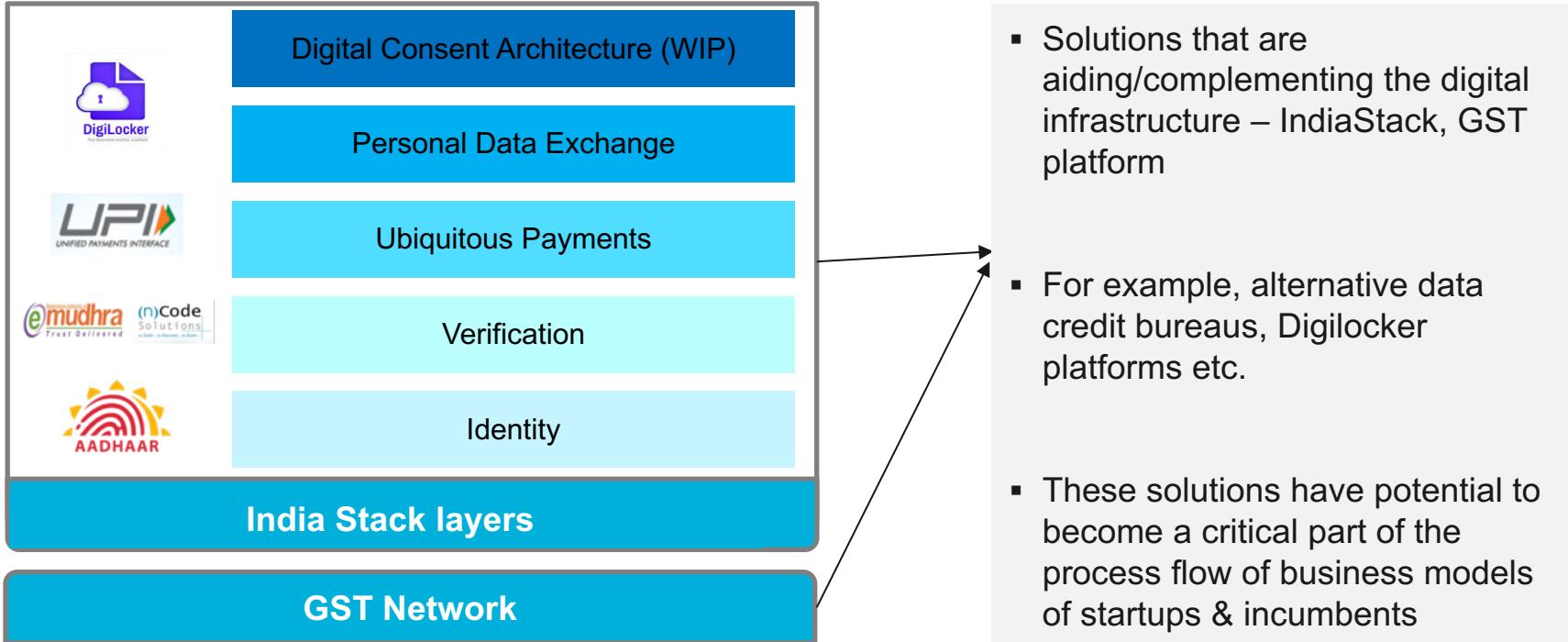


Personal
Loan



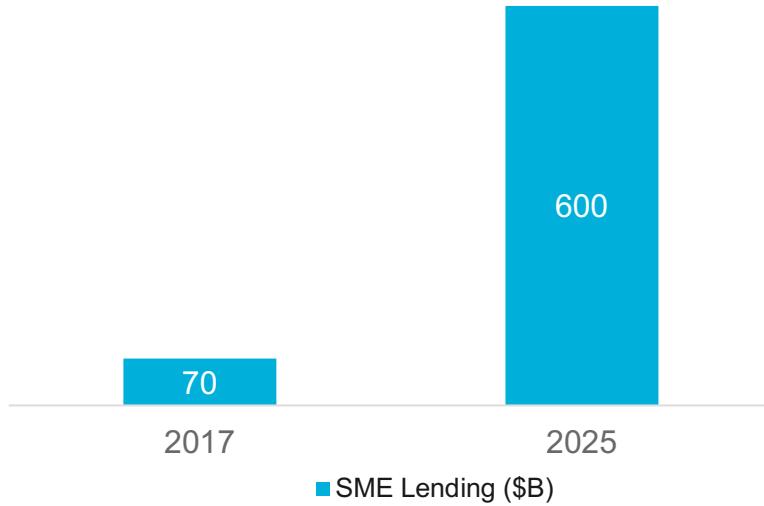
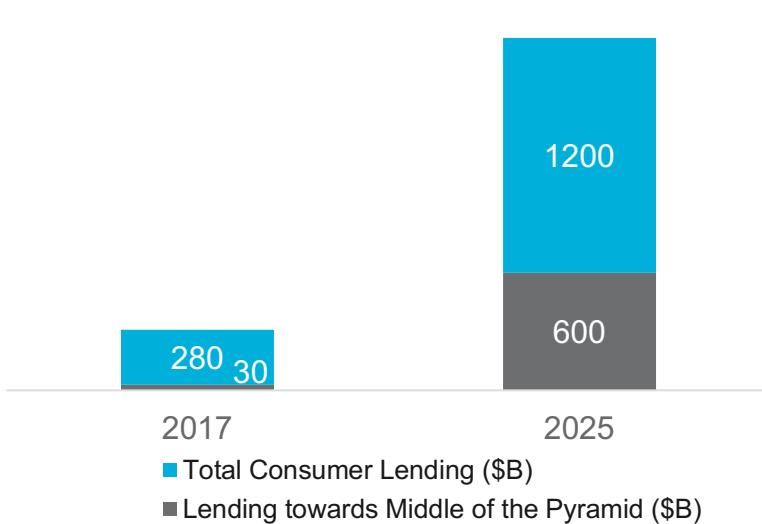
Merchant
Cash Advance

There is also a once in a lifetime opportunity to create standardized platforms at infrastructural layers



Not a winner take all market – Multiple large FinTech players will emerge to serve specific needs

Sizable share of growth will come from players targeting specific micro-market opportunities and going deep into it



Impact on key sectors

Financial services, Logistics, Healthcare, Retail

Technology will be pivotal in bringing operational efficiency in Logistics

Sector lags on most KPIs compared to developed countries

13%

logistics spend as % of GDP
(*World average is 9%*)

40%

avg. utilization of trucks
(65%+ *in most developed countries*)

40%

agriculture produce is wasted due to lack of cold supply chain capacity
(*US average is 17%*)

To be globally competitive, India needs to

1

Build and Improve Infrastructural Capacity

Government and Private sector Logistics players will play a key role

2

Bring Operational Efficiency

Technology players will play a key role

Technology led models pivotal in driving efficiency

Digital freight forwarders / Marketplaces (Trucking, Shipping, Rail)

- Freight forwarders capture **15-20%** of transportation spend
- **Low utilization of asset** (e.g. 35-40% truck utilization) due to sub-optimal supply-demand match

Warehouse automation

- <1% of India's warehouse capacity is **modernized**
- GST led **consolidation** and increased **private sector participation** key macro drivers to drive modernization

Other Models

- SaaS based Fleet management solution
- Supply-chain financing

India's logistics sector lags on most underlying key performance indicators compared to developed economies

Cost, Reach and Timeliness of logistics has direct economic impact on Industries

35th

... rank in Logistics Performance Index (LPI).

Germany is #1

40%

...average utilization of trucks

65%+ in most developed countries

40%

...agriculture produce is wasted due to lack of cold supply chain capacity

US average is 17%

30%

..reachable for e-commerce deliveries

Source: Avendus Logistics Report 2016, IMPA Logistics Report 2017

To be globally competitive, India needs to..

Build and Improve Infrastructural Capacity

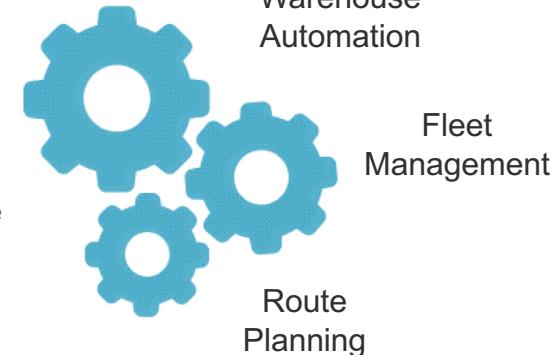
Transport
Roads
Railways
Shipping



Storage
Warehousing
Cold Storage

Bring Operational Efficiency

Better Supply-demand Match
Instant Price Discovery

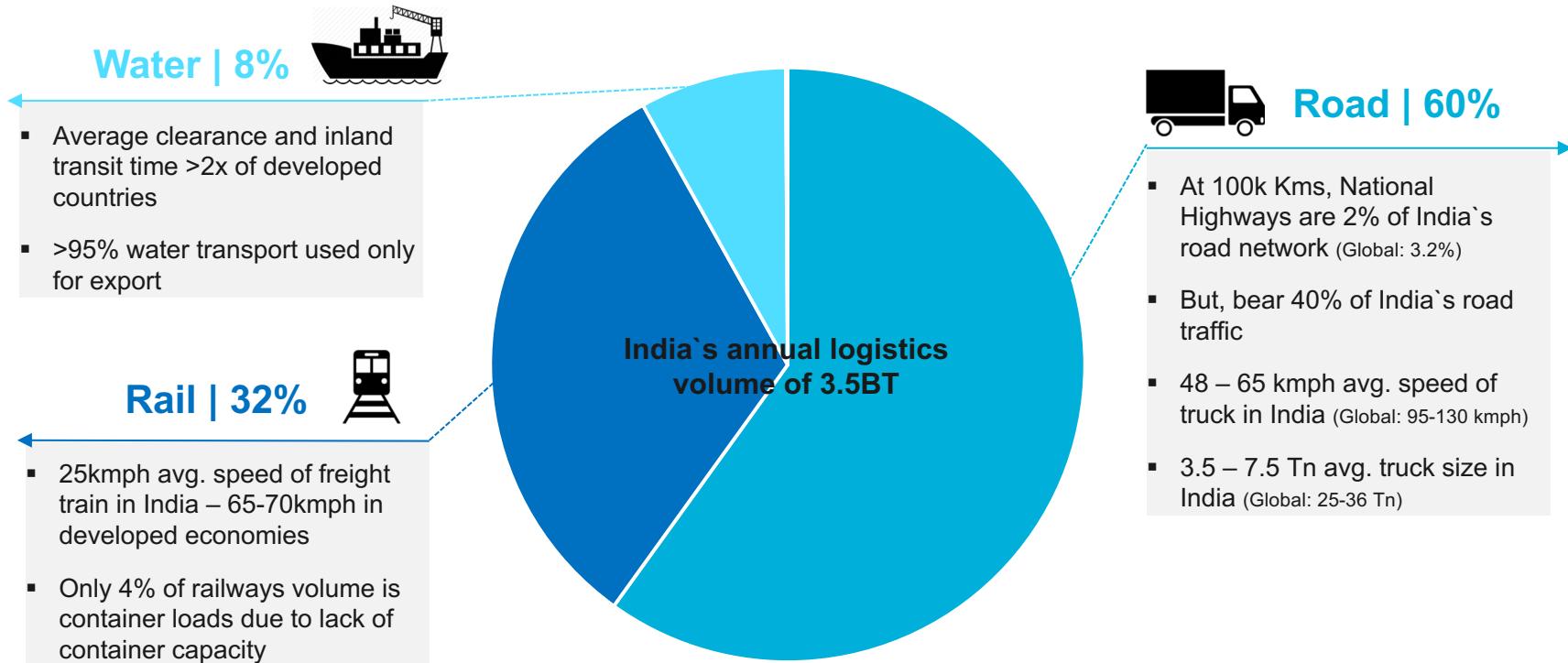


Warehouse Automation
Fleet Management
Route Planning

Government and Private sector Logistics
players will play a key role

Technology players will play a key role

Transport network has infrastructural gaps and lack of intermodal capacity



Source: Avendus Logistics Report 2016, IMPA Logistics Report 2017 | Kalaari Capital Research

Warehousing suffers from fragmentation and inefficiencies

In pre-GST having centralized warehousing was not tax-effective

Led to highly scattered and fragmented warehousing capacity

India's average warehouse size is 1/10th of developed countries

<1% of warehousing capacity is modernized (30% in China)

92% of space controlled by unorganized small players.

75% of organized capacity controlled by government/PSUs

40% agri wastage due to insufficient cold storage capacity

56% of the capacity is utilized to store potato

All cold storage capacity only in top 6 cities

Government is taking immense strides to improve the infrastructure



GST Rollout

- Estimated to bring down transit time by up to 30%
- Current warehouse network is too scattered to optimize on tax. Will give way to more consolidated hub and spoke warehouse network prevalent in developed countries



Ramping up the road transport capacity

- India's highway road network is 2% of total road network, almost half of China
- 83k km of road network to be built over 5 years to bring India to
 - Expected to increase the transport speed by 20-25%



Giving the “Infrastructure” status to sector

- “Infrastructure” status will allow private companies to avail credit at competitive rates
- Will be impetus to increased private sector investments



Dedicated rail freight corridors

- Plan is to connect the high container traffic routes of North to West and North to East through dedicated freight corridors
- Will increase freight handling capacity and average traveling speed from 25km/hr to 70km/hr

Multiple drivers at play for technology led efficiency improvement



GST and Digitization of Supply-chain

An initiative like GST will force the players to digitize their information systems to comply to the GST requirements. This is the first step in the direction of digitization of information systems



Mobile-first Cloud solutions driving rapid tech adoption

On-premise desktop based solutions found it difficult to penetrate into an industry which is dominated by SMBs.

With Smartphone and Cloud, the software penetration is increasing at rapid pace



Maturing Enabler Technologies - IoT, Robotics, Machine Vision

The underlying network connectivity, precision, and security infrastructure has matured to the required level for large scale and cost effective commercialization.

Technologies like IoT, Machine Vision and Robotics will find numerous applications in logistics sector

\$8-10B of the transportation spend goes to freight forwarders – sizable share can be captured by digital players

Bloated costs and sub-optimal utilization due to involvement of freight forwarders..

15-20%

Freight forwarders mark-up the prices by

35-40%

Truck utilization due to sub-optimal supply-demand match. Low utilization also adds to the cost

But these old age businesses will go through digital disruption



India is estimated to have 75,000+ freight forwarders and 6500+ custom agents

The story is no different globally

Instant and transparent price discovery

- Will bring down the freight cost by up to 20%

Better supply-demand match leading to better utilization

- Will add 10-15% to utilization

>20% of India's warehouse capacity will be modernized by 2025 from <1% today

While technology is mature, macro factors have to play out for modernization

Warehouse consolidation

GST will drive warehouse consolidation. Average size estimated to be ~5x of current size in 5 years

Current size is 1/10th of that in developed countries

Automation makes economic sense only beyond certain size

Increased Private sector participation

Government led initiatives (FDI, Infrastructure status to sector) will drive more private investments into the sector. Global 3PL players also entering

98.7% capacity owned by government and small unorganized players

Inherent resistance and slow pace of decision making in government to modernize the capacity

Multiple models will emerge to serve the modernization needs

Own Capacity

Will own the modern warehouse capacity – mostly 3PL/4PL logistics players

Operators

Will lease capacity from other small players. Will modernize and operate the capacity

Solution Providers

Will provide automation solution to other warehouse players

- Autonomous robots
- WMS (warehouse management solution) providers
- IoT based Inventory management

Other technology led enabler models will also emerge

Tracking and route planning of the fleet – Live shipment tracking to customers

- Poor route planning contributes to up to 30% of delays in transport time
- With IoT and smartphones, real-time shipment level tracking possible
- Intelligent routing and planning based on real-time tracking data and historical data can lead to reduced transport time



SaaS based Fleet Management solutions

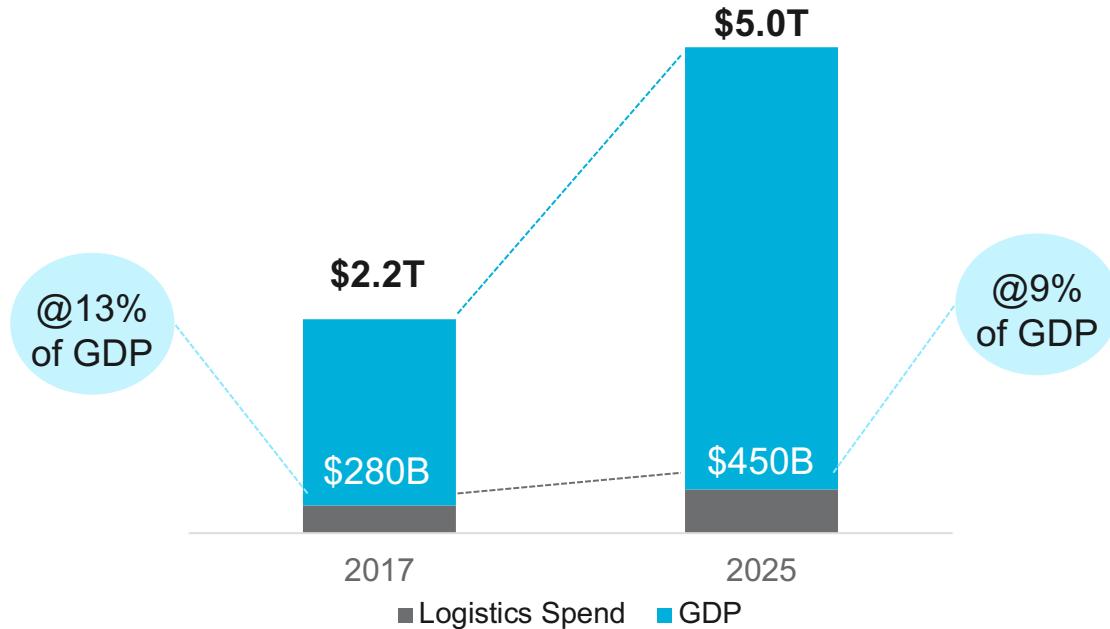
Working capital financing through digital data

- Working capital credit is a lifeline to the sector, operates on 45-90 days credit
- The exposure largely taken by logistics players due to lack of financial product addressing the need
- GST and digitization will generate volumes of data trail for lenders to create specialized cost effective supply-chain financing product for the sector



Supply-chain Financing

India is poised for significant growth, efficiency and disruption in the sector



Cost efficiencies will drive logistics spend to 8-9% of GDP, similar to that in the US and other developed economies



Source: Avendus Logistics Report 2016, IMPA Logistics Report 2017

Impact on key sectors

Financial services, Logistics, Healthcare, Retail

Technology will play a key role in bridging gaps in Healthcare

Poor Access, Affordability, & Quality plague Healthcare

0.7/1.1/1.3

doctors/hospital beds/nurses per 1,000 population

(WHO Recommends: 1/3.5/2.5)

62%

out of Pocket Expenses
(17% in US & 5.6% in China)

154

of 195 countries on Healthcare Access & Quality Index

Technology will bridge the gap and change the status quo

- 1** AI & Cloud – Improving productivity
- 2** Internet of Things (IoT) & Med devices changing risk & timeliness of care
- 3** Unified Electronic Health Records (EHR) improving transparency & reducing cost
- 4** Genomics & Precision Medicine

Realizing the Potential – New business models will emerge

Telemedicine & mHealth

A \$800M Market by 2020

Connected Health Platforms

User Generated Data to bring transparency

Home Healthcare

Physio at home costs 600 vs 1000

AI Enabled Early Detection

Mammograms 30x faster with 99% accuracy

Robotic Assisted Surgeries

1600 Surgeries a month by 2020

Micro Financial Products

Care more affordable for 40% of the population

Deficiencies in 3 pillars - Access, Affordability & Quality - plague India's Healthcare

1.1 Beds & 1.3 Nurses per 1,000
In India vs a WHO recommended 3.5
Beds & 2.5 Nurses

Ranked 154
of 195 countries on Healthcare
Access & Quality Index

Only 15%
Of Indian population has any form of
health insurance

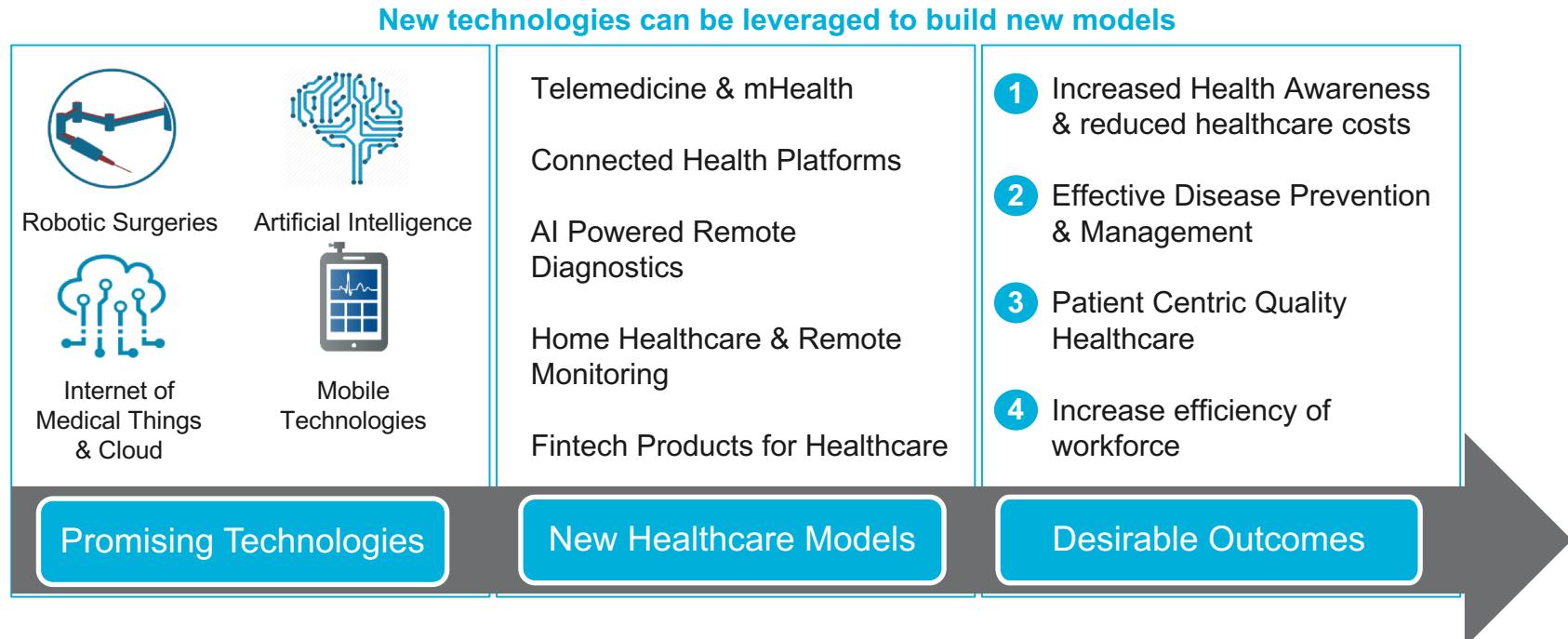
2.07M new doctors needed by 2030
to meet WHO recommended 1:1000
doctor-to-patient ratio

Only 491
of the 33,000 nursing homes and
hospitals are NABH Accredited

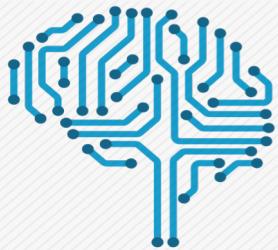
63 Million
Indians who fall into poverty every
year due to healthcare expenses



But, promising new technologies can bridge gaps in access, affordability, and quality



Promising Technologies like Artificial Intelligence (AI) have the potential to reduce costs & improve quality



\$6.6B

Global Health AI
Market by 2021

50%

By which costs of
treatment can be reduced

30% – 40%

By which outcomes
can be improved

Impact on Affordability & Quality

1

Early & Accurate Detection

Mitigates overall cost burden
of disease

AI Enabled Mammograms are
30x faster and 99% accurate

2

Faster Recovery & Shorter Hospital Stays

Robotic assisted precision
surgeries ensures less human
error thus better quality care

Over 20,000 robotic surgeries in
India by 2020

New Healthcare Models like mHealth & Telemedicine enhance the reach of care and improve efficiency



\$800M

mHealth Market in India
by 2020

9%

of total doctor's time
saved using mHealth

76%

Of rural patients can
get medical care from
their own village with
telemedicine

Impact on Access & Availability

1 Access to Specialists

Remote diagnosis & access to specialists save time & money

Majority of the rural Indians travel over 100KM to see specialists & spend 1.5x more than urban Indians due to lack of access at early stages of disease

2 Remote Monitoring

Reduces need for regular hospital visits

Continuous care can be administered more efficiently using mobile technologies

But, is India ready for adoption of these new models & technologies?



60%

Of consumers believe mHealth will improve quality and convenience, and reduce cost



60%

Of Payers & Providers think mHealth is inevitable

And, Healthtech startups are leading the drive for digital health adoption by addressing the deficiencies in the three pillars ...

82%

Aimed at Improving **Quality**

78%

Aimed at Improving **Access**

60%

Aimed at Improving **Affordability**

\$463M

Funding raised by 81 healthtech startups in 2017 in areas like ...

- 1** Technology enabled home healthcare services
- 2** Fitness & Wellness
- 3** Remote consultation, diagnosis, radiology & monitoring

If Digital Health is widely adopted, India will get closer to making quality healthcare accessible & affordable

There are hurdles for digital health adoption ...

- 1 Too few proven business models
- 2 Changing patient behavior
- 3 Lack of information
- 4 Application of inappropriate regulations

But, overcoming these hurdles will result in ...

105M

Additional population
gaining access to
healthcare

15-20%

Reduction in patient's
healthcare cost

Source: PWC - mhealth expected to be crucial in making healthcare accessible in India

Impact on key sectors

Financial services, Logistics, Healthcare, Retail

Technology will be at the center stage of India's **Retail** growth story

Digital will impact all forms of retail – e-tail, modern and general

10%

Of total retail spend will be online by 2025
(3% as on 2017)

80%

Of retail spend will still be from unorganized retail by 2025

Digital distributors will reimagine existing inefficient supply-chains of unorganized retail

E-tail growth will be characterized by

1

Deeper penetration in Tier-2 and beyond
(80% of e-tail spend today is from metro and Tier-1)

Higher per capita income + Increased comfort with digital

2

Increased online adoption of non-electronics categories
(65% of e-tail spend today is from electronics)

Driven by business model innovations

Technology will make unorganized retail supply-chains more efficient

Highly inefficient supply-chain

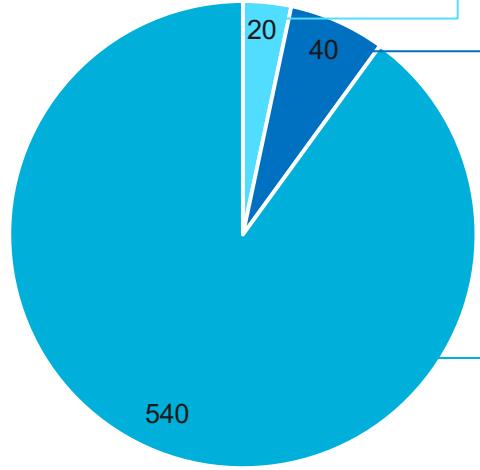
- Every brand has built own distribution
- Not every retailer gets served by distributors. Smaller retailer need to go to wholesale markets for procurement
- Low fulfillment frequency, leading to high inventory levels
- Prevalent channel stuffing

Largest players will emerge to disrupt supply-chains (Digital distributors)

- Will be multi-brand multi-category large digital distributors
- Will disintermediate middle-man to directly connect manufacturer and retailers

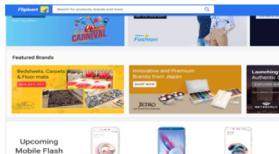
India's largest consumer spend category is still highly unorganized and inefficient

\$650B Retail market in India 2017



■ E-Commerce ■ Moden Trade ■ General Trade

E-tail penetration is still nascent



- E-commerce is **3% of overall retail**; significant headroom to grow
- Constraint by logistics capacity and propensity to transact online to penetrate tier-2 and beyond

Organized retail constrained by viability beyond large cities and towns



- **8.5k** Supermarkets in Metro, Tier 1 and Tier 2 towns in India
- Cover a tiny footprint & consumption of Indian population

Unorganized controls 90% of the spend. Highly inefficient supply-chains

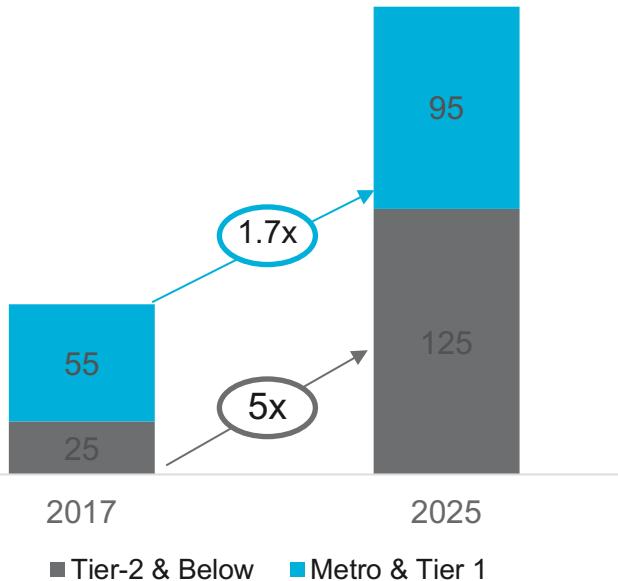


- **25-30M** stores run by micro-entrepreneurs
- Predominantly a cash economy with no paper or digital trail

Source: Kalaari Research, RedSeer India E-tail Report 2017

Deeper penetration in Tier-2 and beyond will drive next phase of e-tail growth

Online shoppers in India (M)



Cost of digital adoption is going down

1 GB 4G data in India costs 20c and smartphone ownership costs just \$50



Internet in India is becoming more native

All large retailers in India have a vernacular based strategy today



More and more Indians are paying online

UPI (free payment interface) is already doing 150M transactions a month. BharatQR and AePS to aid this



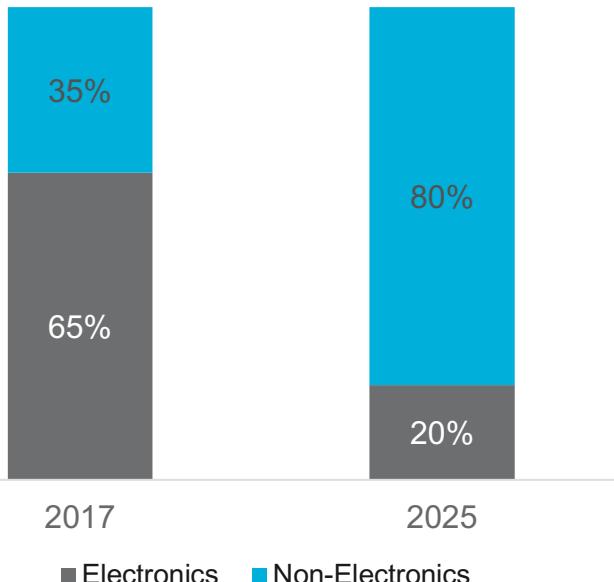
Cost of servicing Tier-2 is going down

Many logistics and supply chain companies are innovating digitally to bring costs down

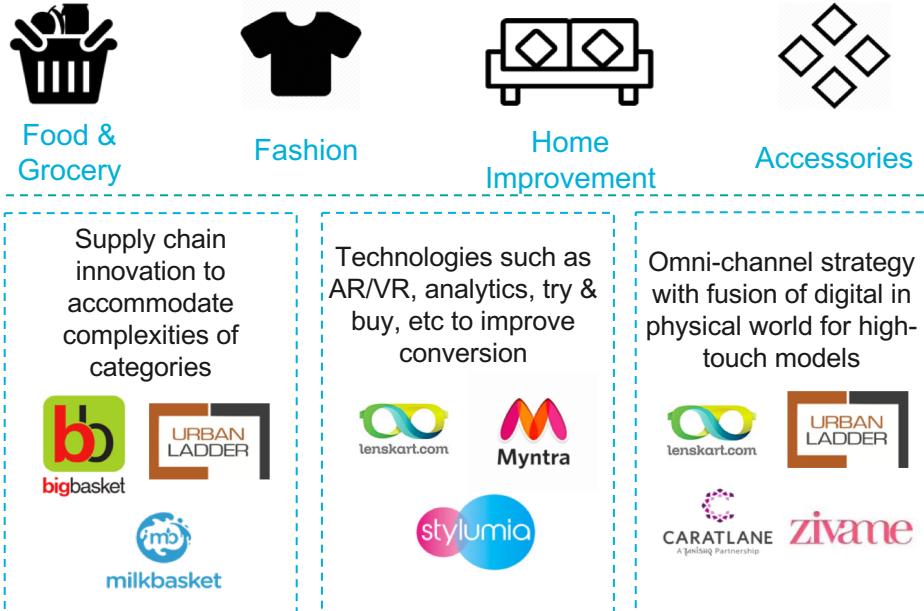
Source: Kalaari Research, Redseer India E-tail Report 2017

Non electronics categories will witness higher online adoption through business model innovations

Share of non-electronics category will become 80% by 2025

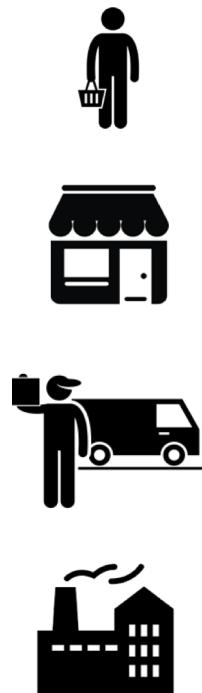


Non-electronic categories on the rise



Source: Kalaari Research

Opportunity to re-imagine archaic offline retail supply chains through technology



Most disruptions have happened in retail to consumer space

E-tailing Opportunity

Distribution networks are inefficient and broken – opportunity for digital disruptions

B2B E-commerce Opportunity

25-30M small retail shops contribute 90% of the retail spend, but suffer:

- Every brand has built own distribution network
- Not every retailer gets served by distributors. Smaller retailer need to go to wholesale markets for procurement
- Low fulfillment frequency, leading to high inventory levels
- Prevalent channel stuffing

Multiple technology first models are emerging

ninjacart Direct procurement from farms

Jumbotail Digital buying for retailers in Food & Grocery segment

Judaan Digital buying platform for retailers (segment agnostic)

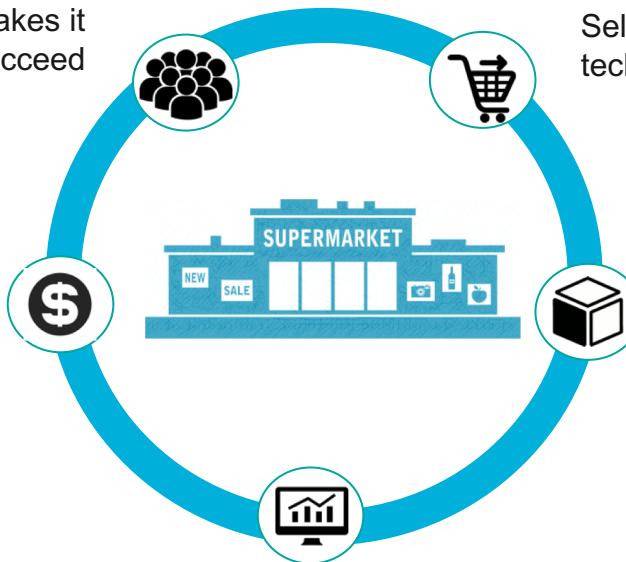
wholesalebox Lowest Factory Price Digital buying for retailers in fashion segment

ElasticRun THINKING NETWORK Logistic platform to distribute to retail

Technology will make Modern Trade more efficient and improve the consumer experience

High density of Indian cities makes it difficult for Big Box retail to succeed

Significant capital expenditure will be required for expansion



Analytics to help manage store inventory for faster turnaround times.

Self-checkout & contact-less payment technologies for faster checkouts

Fulfilment models – buy online, pick-in-store; buy online get home delivered

What needs to be done?

Organizations, startups and investors will need to gear up to seize opportunities in a digital economy

Traditional organizations

Reimagine business models with a 'Digital first' lens and leverage ecosystem capabilities

Develop novel relationships that unleash new sources of value, like monetization of data

Source innovation from startups, other ecosystem participants, crowdsource disruptive ideas to create new digital experiences

Startups

Focus on creating value for next 400M or India 2.0 consumers

Focus on India specific nuances – Vernacular offerings, voice based interfaces, volume vs price choice etc.

Partner with large organizations for validation of product, initial customers, and distribution capabilities

Investors

Become anchors of building ecosystem capabilities by bringing startups, large organizations, and regulators together

Take active part in driving policy and regulatory framework for sectors at the verge of immediate digital disruption

Help develop entrepreneurial ecosystem beyond top-10 cities of India

Key questions for business ecosystem stakeholders

1. Does your current strategy address how you are going to compete in a future digital economy ?
2. How are you leveraging organizational / external data sources and emerging technologies?
3. How extensively are you collaborating with startups and other ecosystem partners to drive innovation in the business ecosystem ?

Acknowledgments

Executive Sponsors and Guidance



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