

RESEARCH REPORT | INTERNET HISTORY | AI FUTURES

The Next Leap

How developing economies adapted to the internet - and how artificial intelligence may change them next

The internet let countries bypass missing physical networks. AI may let them bypass parts of the expertise shortage. But every leap creates a new bottleneck - and the countries that own the context, skills and distribution will capture more value than those that merely rent intelligence from abroad.



THE DEVELOPMENT PATTERN



Central claim

Leapfrogging is not the absence of weak links. It is the relocation of the weak link.

01 | The Short Version

The developing world did not simply receive the internet. It reorganised around the cheapest part of it.

- **The first leap was mobile.** Many countries expanded connectivity without first building universal fixed-line networks. A handset became a communications network, bank branch, shopfront and identity interface.
- **The second leap was institutional.** Kenya's mobile money, India's UPI and Brazil's Pix did not merely digitise old payment habits. They created cheap public or regulated rails on which firms and households built new behaviour.
- **Adoption was faster than productivity.** People embraced phones and payments before firms reorganised production. The internet changed access immediately, but aggregate productivity depended on electricity, logistics, skills, management and competition.
- **AI changes the scarce input.** The internet made information transport cheap. Generative AI makes some interpretation, drafting, translation, coding and diagnosis-like assistance cheap. For economies short of teachers, clinicians, extension officers and managers, that is potentially developmental.
- **Lower exposure is not automatic protection.** The ILO estimates only about 10-15% of employment in low-income countries is exposed to GenAI, versus roughly 30-32% in high-income economies. But connected service workers may face competition quickly while infrastructure prevents the wider workforce from capturing gains.
- **The strategy is adaptation, not frontier imitation.** Most countries do not need a national frontier model. They need affordable access to compute, local-language and sector data, skilled adopters, open standards, reliable power and institutions capable of buying and auditing systems.
- **The distribution question comes first.** If models are imported, data leave the country and cloud bills rise, productivity can improve while domestic value capture remains thin. The winning position is to own the last mile: context, trust, workflow and customer relationship.

THE INTERNET MADE DISTANCE CHEAP. AI MAKES A SLICE OF EXPERTISE CHEAP.

The economic prize is not using AI. It is redesigning farms, classrooms, clinics, firms and public services around what becomes newly abundant.

02 | What Internet Leapfrogging Actually Changed

Leapfrogging is often described as skipping a stage. The more accurate description is recombination: countries used a new general-purpose technology to route around an expensive legacy system.

DOMAIN	LEGACY BOTTLENECK	INTERNET-ERA ROUTE	WHAT CHANGED
COMMUNICATION	Fixed telephone lines	Mobile networks	People and small firms became reachable before universal wired infrastructure.
FINANCE	Bank branches and cards	Mobile money and instant rails	Payments, transfers and merchant acceptance expanded through phones and agents.
COMMERCE	Formal retail networks	Marketplaces and social commerce	Sellers reached urban and foreign customers without a national store footprint.
WORK	Local employer geography	Remote services and platforms	Some labour became internationally tradable, especially software and business services.
STATE	Paper offices	Digital identity and payment rails	Benefits, tax, licensing and verification could move to direct digital channels.

03 | What Did Not Disappear

PHYSICAL SYSTEMS

Ports, roads, power, housing and factories remained expensive. Digital demand exposed logistics and reliability failures rather than abolishing them.

CAPABILITY

A connection did not guarantee literacy, management quality or technical skill. Adoption could grow while productive use stayed shallow.

INSTITUTIONS

Digital systems scaled both good and bad rules. Weak competition, fraud, surveillance and exclusion could also become faster.

The lesson for AI is severe: a chatbot can cross a border instantly; a reliable clinic, court, school or power grid cannot.

04 | Six Economies, Six Starting Points

The same technology lands in radically different economic structures. GDP size affects market scale; GDP per person affects purchasing power; employment ratios reveal participation but not productivity or job quality; internet use sets the reachable population.

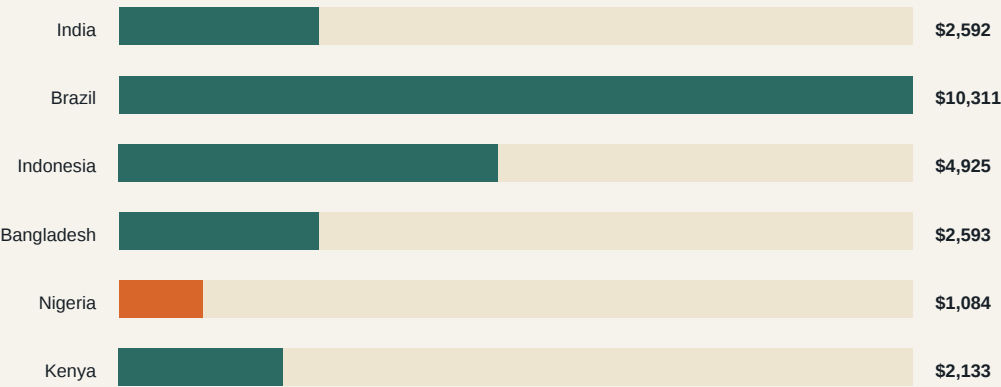
COUNTRY	GDP 2024 US\$ bn	GDP/HEAD US\$	EMPLOYMENT RATIO 2024	INTERNET USERS 2023	INTERNET-ERA ROUTE
India	3,760.8	2,592	53.3%	60.3%	UPI + digital public infrastructure
Brazil	2,185.8	10,311	59.0%	84.2%	Pix + platform commerce
Indonesia	1,396.3	4,925	65.7%	69.2%	Mobile commerce + digital services
Bangladesh	450.1	2,593	56.8%	44.5%	Mobile finance + export production
Nigeria	252.3	1,084	80.1%	40.1%	Fintech + agent networks
Kenya	120.4	2,133	63.7%	32.1%	Mobile money + digital agriculture

Source: World Bank indicators NY.GDP.MKTP.CD, NY.GDP.PCAP.CD, SL.EMP.TOTL.SP.ZS and IT.NET.USER.ZS. GDP and employment: 2024. Internet use: 2023, the latest common year in this comparison.

05 | The Employment Number Can Mislead

Nigeria's employment-to-population ratio is the highest in the table, while GDP per person is the lowest. That is not a contradiction. In economies with limited social protection, people cannot afford not to work. The statistic counts activity; it does not tell us whether work is formal, productive, secure or well paid.

GDP per person, 2024 (current US\$)



For AI policy, job quality and productivity matter more than headline employment. A tool that raises output per informal worker may matter more than one that automates a small formal occupation.

06 | India: When the Rail Becomes the Market

India's leap was not one app. It was a stack: identity, bank accounts, mobile access and interoperable payments. That reduced the cost of proving who someone was, moving money and building services on top.

IDENTITY

Aadhaar created a reusable identification layer.

ACCOUNT

Financial inclusion programmes expanded account access.

PAYMENT

UPI made instant account-to-account payment interoperable.

INNOVATION

Banks, fintechs and merchants competed above common rails.

24.5 BILLION TRANSACTIONS

UPI processed 24.509 billion transactions in August 2026 across 752 live banks, with a value of about INR 29.82 trillion in that month.

What changed: the smallest merchant could accept an instant payment without owning a card terminal; transaction data became part of credit and tax infrastructure; the state could move benefits directly; software firms could serve a national market through a common interface.

What did not automatically change: a payment rail did not guarantee formal credit, consumer protection, profitable small firms or high-productivity employment. Interoperability reduced one friction; it did not remove every weak link.

07 | The AI Analogy

India's AI advantage is less about training the world's largest model than connecting affordable models to a dense digital public infrastructure and enormous multilingual markets. Farmer registries, health records, payment rails and public service workflows can make small models useful at scale - if privacy, accuracy and accountability are designed in.

THE RISK

The same integration that makes delivery efficient can also concentrate surveillance, exclude people whose records are wrong, and turn public infrastructure into a gateway for private rent extraction. Digital scale magnifies governance quality.

Source: National Payments Corporation of India, UPI Product Statistics, August 2026; Reserve Bank of India, Annual Report 2023-24; World Bank, Digital Progress and Trends Report 2025.

08 | Kenya and Nigeria: Access Before Formality

Africa's digital finance story did not wait for universal bank branches. It used phones, agents and regulation to bring the transaction point closer to the household.

KENYA | MOBILE MONEY AS INFRASTRUCTURE

In 2024 Kenya had **42.3 million** mobile-money subscriptions and **381,116** active agents. Average monthly mobile-money value reached **KSh 724.8 billion**. The 2024 FinAccess survey counted **23.2 million** mobile-money users and found daily use had more than doubled since 2021. The leap was geographic: agents made cash-in and cash-out local while the ledger moved nationally.

NIGERIA | SCALE THROUGH AGENTS

By end-2024 the Central Bank of Nigeria reported financial inclusion at **74%**, with **1.95 million** agents. This sits beside a 2024 employment ratio of **80.1%** and GDP per person of roughly **\$1,084**: access has widened faster than productive formal employment. Digital finance can move value efficiently without solving the scarcity of high-output jobs.

09 | The Deeper Pattern

- **Last-mile distribution beat institutional density.** A trusted local agent substituted for a distant branch.
- **Cash did not vanish.** The digital system succeeded by interfacing with cash, not pretending informality had disappeared.
- **Regulation became part of the product.** Transaction limits, licensing, interoperability and consumer protection shaped adoption.
- **New risks arrived with access.** Fraud, expensive digital credit, data misuse and outages became system-level concerns.

AI WILL NEED ITS OWN AGENT NETWORK

Not necessarily people handling cash, but teachers, nurses, extension officers, accountants and community organisations who translate model output into trusted action. The interface may be digital; adoption will still be social.

Source: Central Bank of Kenya, Bank Supervision Annual Report 2024 and FinAccess Household Survey 2024; Central Bank of Nigeria, Financial Stability Report December 2024; World Bank indicators.

10 | Brazil, Bangladesh and the Scale of Everyday Rails

Leapfrogging becomes durable when the new rail is ordinary enough to disappear into daily life.

BRAZIL | PIX

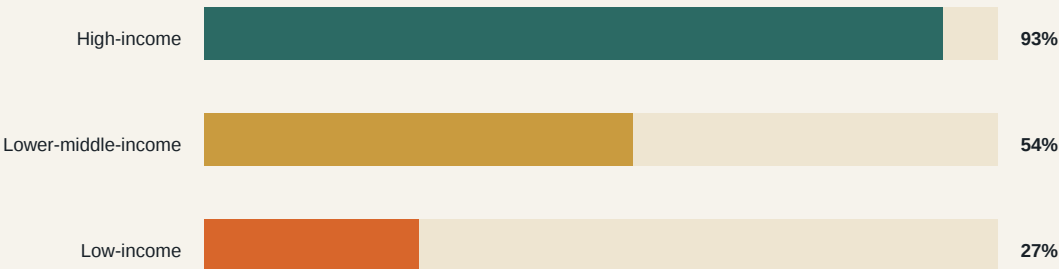
In 2025 Pix recorded nearly **80 billion transactions** worth more than **R\$35 trillion**. By year-end, **148 million people** and **12.8 million firms** had used it. In January 2026 alone, Pix handled more than 7 billion transactions. A central-bank-built instant rail became a mass-market behaviour and lowered the relevance of legacy transfer products.

BANGLADESH | MOBILE FINANCE

Bangladesh Bank's 2025 payment systems report described mobile financial services as a digital lifeline with about **250 million registered accounts** and **2.0 million agents**. Accounts are not unique people, but the scale shows how a low-cost mobile layer can coexist with export manufacturing and reach households beyond conventional branches.

11 | The Internet Divide Never Closed

In 2024, 93% of people in high-income countries used the internet, versus 27% in low-income economies; 2.6 billion people remained offline. Average monthly mobile data use per subscription was about eight times higher in high-income than low-income countries. The next leap therefore starts on an unfinished foundation.



Source: ITU Facts and Figures 2024; Banco Central do Brasil, Pix Management Report 2023-2025; Bangladesh Bank, Payment Systems Report 2025.

12 | The Weak-Links Model for Development

Charles Jones's US paper asks why a spectacular technology can coexist with ordinary growth. The answer is complementarity: output is constrained by the tasks and systems that improve slowly. The same logic is even more important in developing economies.

ECONOMIC VALUE FROM AI *is limited by the weakest complement among*

connectivity x compute x context x competency x institutions

1

CONNECTIVITY

Power, coverage, affordability and device access.

2

COMPUTE

Cloud access, chips, data centres and cost.

3

CONTEXT

Local languages, trusted records and sector data.

4

COMPETENCY

Users who can question, verify and redesign work.

5

INSTITUTIONS

Procurement, standards, rights, competition and accountability.

A country does not need every link to be world-class. It needs the links to be good enough for a specific use case. This is why a crop-disease model running offline on a phone may deliver value earlier than a national supercomputer.

13 | Two AI Futures for Developing Economies

As in the Jones paper, the useful scenarios are deliberately different. Reality will sit between them and will vary by sector.

SCENARIO A | THE AUGMENTED LEAP

AI becomes a cheap layer of expertise over mobile networks and digital public infrastructure.

Farms: local advice improves timing, input use and disease response.

Schools: teachers receive lesson support and students get guided practice.

Clinics: nurses triage, document and follow up more patients.

Firms: small exporters gain translation, compliance, design and software capacity.

State: casework, procurement review and citizen service become faster.

Productivity rises first inside existing occupations. New firms grow around local data, distribution and trust. The technology narrows some expertise gaps before countries can train enough specialists.

SCENARIO B | DISRUPTION WITHOUT DIVIDEND

Imported AI competes with the most connected workers, but complementary systems stay weak.

Services: routine BPO, translation and content work face global price pressure.

Firms: large companies adopt while informal and small firms cannot integrate tools.

State: procurement buys opaque systems that cannot be audited locally.

Data: domestic records train foreign products; subscription and cloud rents flow outward.

People: English-speaking urban workers absorb disruption while rural workers see little productivity gain.

Adoption looks high, but domestic value capture remains low. Inequality grows between connected firms and everyone else - and between countries that shape models and countries that only consume them.

14 | Why Both Can Happen at Once

A country can experience the augmented leap in agriculture and disruption without dividend in business-process outsourcing. It can gain cheaper public services while becoming more dependent on foreign cloud providers. National averages will conceal these sectoral splits.

THE KEY QUESTION IS NOT 'WILL AI ARRIVE?'

It is: which domestic bottleneck does AI relax, which new dependency does it create, and who owns the resulting margin?

15 | Where the First Dividends Could Appear

The largest early gains are likely where expertise is scarce, the task is repeatable, errors can be checked, and delivery already has a human or mobile channel.

AGRICULTURE

Advice at scale

Kenya's Agricultural Observatory Platform already supplies real-time information to 1.1 million farmers. Small AI can add local forecasts, disease recognition and market advice on basic devices. India's Saagu Baagu initiative reported 21% higher chilli yields, 9% lower pesticide use and 5% lower fertiliser use in an early programme cited by the World Bank.

EDUCATION

A co-teacher, not a robot school

A Nigeria pilot in Edo State used teacher-guided generative AI sessions aligned to the curriculum. The development opportunity is teacher leverage and practice feedback; the weak links are device access, pedagogy, safeguarding and rigorous evaluation.

HEALTH

Extend scarce clinicians

Low-bandwidth tools can screen images, structure notes and guide follow-up. The most valuable design keeps a nurse or clinician responsible, uses verified local protocols and records uncertainty rather than inventing certainty.

SMALL BUSINESS

The invisible back office

Drafting, bookkeeping, translation, procurement search, customer support and simple software become cheaper. The gain is not an AI start-up count; it is whether ordinary firms sell more, waste less and enter new markets.

GOVERNMENT

Administrative capacity

AI can help classify cases, translate citizen requests and find anomalies. But weak data and weak appeal rights can turn administrative speed into faster error. Public-sector use needs audit trails, human review and contestability.

Source: World Bank, Digital Progress and Trends Report 2025 and associated agriculture and education case studies; figures describe programmes and early results, not economy-wide causal effects.

16 | Jobs: A Small Buffer, Big Bottlenecks

The newest evidence complicates both panic and complacency. Developing economies have fewer clerical and professional jobs, so fewer workers are directly exposed to GenAI. But they also have less connectivity and fewer complementary systems, so the productivity dividend can be harder to realise.

ECONOMY GROUP	GENAI-EXPOSED EMPLOYMENT	INTERPRETATION
High-income	about 30-32%	More cognitive work means both greater automation pressure and more augmentation potential.
Low-income	about 10-15%	Less formal cognitive work reduces immediate exposure, but connectivity-adjusted access sharply reduces the potential dividend.

Source: ILO Working Paper 166 (2026). Exposure is task potential, not a forecast of job losses.

17 | Four Labour-Market Effects to Watch

1

THE APPRENTICESHIP PROBLEM

If entry-level drafting, coding and analysis are automated, where do young workers acquire judgement? Firms may gain output now while weakening the future skills pipeline.

2

THE BPO SQUEEZE

Countries that exported routine cognitive labour on cost may face price pressure. The defence is deeper domain knowledge, client trust, regulated workflows and AI-assisted quality.

3

THE INFORMAL PRODUCTIVITY TEST

The decisive question is whether tools reach traders, farms and microenterprises. Employment statistics will barely move if the same people work, but income can rise if each hour produces more value.

4

THE GENDER CHANNEL

ILO research finds female-dominated occupations are almost twice as likely to be exposed globally as male-dominated ones, reflecting concentration in clerical and administrative roles. Training and transition policy cannot be gender-neutral.

18 | Country Pathways to 2035

These are directional scenarios, not forecasts. Each begins from the economic structure and digital route documented earlier.

INDIA

AI over digital public infrastructure

Scale multilingual public and private services; defend privacy and competition; shift IT exports from labour-arbitrage to AI-assisted domain capability.

BRAZIL

AI over real-time finance and a large consumer market

Combine Pix, open finance and firm data to improve credit and services; prevent platform concentration and automated fraud from eroding trust.

INDONESIA

AI inside mobile commerce and logistics

Improve merchant operations across an archipelago; build Bahasa and regional-language context; manage dependence on foreign clouds and platforms.

BANGLADESH

AI beside export manufacturing

Use tools for quality, forecasting and worker training; diversify into higher-value services; avoid leaving female production workers outside the skills transition.

NIGERIA

AI through agents, fintech and a large informal economy

Target agriculture, trade and public administration; connect local-language tools to trusted intermediaries; turn high labour participation into higher productivity.

KENYA

AI over mobile money and agricultural data

Pair offline-capable tools with extension networks and payments; build regional service exports; protect farmers' data and measure yield rather than app downloads.

The common move is from consuming general intelligence to embedding verified intelligence in a local workflow. That is where domestic firms, workers and institutions can still own value.

19 | A Policy Playbook: Build the Complement, Not the Monument

The prestige project is a national frontier model. The development project is making thousands of ordinary organisations more capable.

- 01

FINISH CONNECTIVITY

Treat reliable electricity, affordable data and devices as AI infrastructure. Publish price, speed, outage and usage data by region and income.
- 02

RENT COMPUTE WISELY

Most countries should negotiate diversified cloud access and regional capacity before subsidising prestige-scale national compute. Avoid single-vendor lock-in.
- 03

OWN CONTEXT

Digitise and govern high-value local data: languages, crops, disease protocols, curricula, laws and public records. Clarify consent, licensing and benefit sharing.
- 04

TRAIN ADOPTERS

Build capability among teachers, nurses, civil servants, accountants, farmers' organisations and SME managers - not only machine-learning engineers.
- 05

BUY OUTCOMES

Public procurement should test accuracy, cost, equity and appeal in real workflows. Pay for verified service improvement, not impressive demonstrations.
- 06

KEEP MARKETS OPEN

Require portability, interoperable interfaces and audit access where public functions are involved. Competition above common rails powered earlier leaps.
- 07

PROTECT THE FIRST RUNG

Create apprenticeships and supervised AI work so automation of junior tasks does not destroy the path to senior judgement.
- 08

MEASURE DOMESTIC CAPTURE

Track local wages, firm margins, tax revenue, cloud imports, data ownership and productivity. User counts are not an economic-development scorecard.

THE STRATEGIC RULE

Import the general capability. Own the local context. Compete in the last mile. Audit the outcome.

20 | Conclusion: Leapfrogging Without Illusions

The internet era shows that developing countries are not passive recipients of technological change. They adapt new tools to missing institutions, invent new distribution systems and often move faster precisely because there is less legacy infrastructure to defend.

But the history is not a fairy tale of stages skipped. Mobile networks reduced the need for fixed lines, then made spectrum, devices and data affordability more important. Mobile money reduced the need for branches, then made agents, identity, fraud control and interoperability more important. E-commerce reduced the need for shops, then made logistics, payments and platform power more important.

AI follows the same pattern. It may reduce the scarcity of some cognitive tasks, then make reliable data, verification, domain judgement and accountability more valuable. Countries can gain even without building frontier models. Yet if they own none of the context, infrastructure or distribution, they may receive cheaper services while surrendering much of the economic margin.

The internet rewarded countries that became mobile-first. AI will reward countries that become capability-first: not those with the loudest strategy, but those that turn intelligence into reliable action in ordinary institutions.

21 | Method and Limits

- 'Developing world' is used as shorthand for low- and middle-income economies. The group is highly diverse; six countries are illustrative, not representative.
- GDP is current US dollars and is sensitive to exchange rates. GDP per person does not measure distribution. Employment-to-population ratios do not measure hours, formality, productivity or pay.
- Country indicators use the latest common years available in the World Bank API: 2024 for GDP and employment; 2023 for internet use. Platform and payments figures use later national releases where stated.
- AI exposure estimates measure the technical exposure of occupational tasks, not adoption, displacement or realised productivity. Scenarios to 2035 are analytical, not numerical forecasts.
- Programme results in agriculture and education may not generalise nationally. The report distinguishes measured facts from interpretation, but causal evidence on economy-wide AI effects remains limited.

The attached Jones paper supplied the weak-links lens and the discipline of presenting contrasting scenarios. The developing-economy argument, country selection and policy synthesis are original to this report.

22 | Principal Sources

Primary and institutional sources used for factual claims and statistics

World Bank Data	GDP, GDP per capita, employment-to-population ratio and internet-use indicators. api.worldbank.org/v2/
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