

DIGITAL ECOSYSTEM FOR SKILLING AND LIVELIHOOD (DESH)

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Acknowledgements

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EXECUTIVE SUMMARY



Overview

In the Union Budget 2022-23, the Finance Minister announced the launch of a new Digital Ecosystem for Skilling and Livelihoods, the DESH-Stack eportal. Several issues continue to plague the existing skilling landscape in the country. Common issues include a lack of skilled labour, a supply and demand mismatch of skilled personnel, limited training facilities, and a lack of recognition of skills among them. DESH-Stack aims to solve these challenges by bringing together stakeholders in one digital ecosystem, enabling easier discovery of opportunities and services, and improved verification and credibility through digital skilling credentials of citizens. Effective mapping of supply and demand can potentially increase the skill level of the workforce, reduce the unemployment rate and enable the assessment of market-relevant skills.

DESH-Stack layers

The DESH-Stack, like other stacks developed by the Government, has layers for identification, data collection and storage, and open protocols. **The Trust layer** consists of the electronic registries of information on all stakeholders and verifiable digital skilling credentials. A digital credential or digital skilling identity acts as a repository for an individual's qualifications. The stack offers digital credentials that allow certificates to be awarded and verified in a digitised manner. Electronic registries act as a single point of access for all information. This enables easy exchange of training and associated services across stakeholders. **The Finance layer** of the DESH-Stack leverages the India stack, the payments ecosystem, to deliver financial services through the portal. It supports interactions between financial resource providers, individuals and organisations to increase accessibility to those in need. **The Discovery layer** is facilitated through open protocols that increase interoperability and discovery of services across stakeholders. Platform developers use these protocols to build end-user solutions over the stack. Keeping in mind the need for robust governance frameworks and safety protocols to ensure safe and effective use of the stack, the Government has set up the National Facilitating Organisations (NFOs). NFOs are responsible for stakeholder registration and management, policy formulation and dispute resolution for the stack. This is similar to NFOs set up for other stacks such as National Payments Corporation for UPI, Account aggregators for consent management etc.

Stakeholder use cases

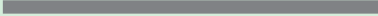
The implementation of DESH-Stack not only solves the general inefficiency of the skilling landscape overall, but also specific challenges faced by certain sections of society. These include (i) digital credentials and secure recruitment processes through the portals solve for lack of recognition of skills and unreliable employers for the informal sector; (ii) easier discovery of jobs improve inclusion of the disabled workforce; (iii) access to credentials and achievements of allied health workers helps consumers in making informed decisions and (iv) access to all jobs on one portal helps in the true assessment of market needs in case of the formal sector.

Role of philanthropic organisations

Philanthropic organisations play a crucial role in catalysing the adoption of the stack by (i) incentivising platform builders to create solutions that cater to the non-profit sections of society, enabling the development of solutions that create sustainable local livelihoods ecosystem; (ii) supporting local entrepreneurs and migrant returnees with market linkages, innovative financing such as first loss guarantees; (iii) engaging in policy advocacy and ecosystem building with government and other stakeholders and (iv) supporting NGOs working in this space by strengthening their ICT infrastructure, developing open-source tools for NGOs and providing onboarding support on platforms.



CONTEXT



Since the launch of the User Payments Interface (UPI), the government has explored various digital public goods across sectors.

BACKGROUND

- India has emerged as a pioneer in developing and deploying digital public goods at scale.
- It was one of the first developing countries to have a digital ID initiative for its population scale and has built digital payments infrastructure such as the UPI.
- Since the launch of UPI in 2016, the government has looked to create similar digital public goods in a host of other areas such as digital lending, healthcare, agriculture, livelihoods and others.

CONTEXT

- This primer aims to provide a basic understanding of the government's DIGITAL ECOSYSTEM FOR SKILLING AND LIVELIHOOD (DESH) that aims to be a digital infrastructure or stack for the education and skills ecosystem to enable easy exchange for skill development, deployment and associated supply-chain and enabling services.
- The objective of this primer is to:
 - Build a case for DESH-Stack's applicability in the current skilling scenario
 - Understand the layers, building blocks and governance of the DESH-Stack
 - To understand the role philanthropic organisations can play in expanding adoption of the stack

During the Budget 2022-23, Nirmala Sitharaman, India's Finance Minister, announced that a Digital Ecosystem for Skilling and Livelihood or DESH-Stack eportal will be launched to empower citizens to skill, reskill or upskill through online training.

"It will also provide API-based trusted skill credentials, payment and discovery layers to find relevant jobs and entrepreneurial opportunities," she said.



The current skilling system is inefficient with several gaps in supply and demand.

Lack of skilled labour

Only **1 in 5** Indians in the labour workforce **is skilled** (*UNDP 2020*)

Lack of literate labour

40% of marginal workers are illiterate, while **30% of** main workers are illiterate (*Census data 2015*)

Skill demand supply mismatch

75% of 150 companies surveyed report a **skill gap** in their industry (*Wheebox 2022*)

Limited training facilities

Current annual training capacity of India is **4.3 million**, which is **20%** of the industrial requirement of **22 million skilled workers** a year (*NSDC 2014*)

Lack of formally recognised skills

390 million individuals have acquired skills informally, through self-learning, on-the-job learning, inherited skills or other sources (*Centre for Monitoring Indian Economy 2019*)

Gender gap in workforce

Of the 395.2 million labour workforce in the country, only **91.6 million** are women (*Quartz 2019*)



The government's DESH-Stack eportal, an open digital ecosystem in skilling and livelihoods, provides solutions to fill in these gaps.

Key challenge	Current gap in the system	How will DESH-Stack solve it?
Lack of skilled labour and supply demand mismatch	<ul style="list-style-type: none"> Broken value chain between employers, trainers and trainees <ul style="list-style-type: none"> Current skill ecosystem is characterised by various platforms that exist in silos E.g. A person has to separately register on various platforms (LinkedIn, Naukri, etc.) to find employment opportunities Lack of alignment between training curriculum and industry requirements (<i>Wheebox 2022</i>) 	<ul style="list-style-type: none"> Enabling discovery of skill development opportunities for candidates Discovery of trainers for training organisations Enable employers to locate prospective employees and vice versa by bringing them on one digital network Individuals can discover market relevant skills to develop and run a targeted job hunt based on their existing skill set
Lack of formally recognised skills	<ul style="list-style-type: none"> Paper certificates have various shortcomings: <ul style="list-style-type: none"> Difficult to trust Requires human evaluation Difficult to access universally Requires physical presence of 'original' copy 	<ul style="list-style-type: none"> Offering digital skill credentials would provide: <ul style="list-style-type: none"> Instant, permanent, online and offline verification Enable comparisons across candidates at scale Abides to set published standards Replicable (no original) and electronically shareable
Limited access to skilled training	Exclusion of women, persons with disability and other social and economically disadvantaged sections from workforce due to limited access to trainings and information on opportunities	<ul style="list-style-type: none"> DESH will facilitate inclusivity by providing ease of discovery between consumers and providers
Information asymmetry	Information asymmetry prevents financial resource providers to direct their resources towards those in need	<ul style="list-style-type: none"> Support interactions between impact and financial capital providers, and aspiring individuals and organisations in need of these resources



The DESH-Stack provides a unified architecture, open specifications, and participation rules to develop a digital skilling ecosystem in India.

What is DESH?

Digital Ecosystem for Skilling and Livelihood (DESH) is envisioned to be a digital infrastructure or stack for the education and skills ecosystem to enable frictionless exchange for skill development, deployment and associated supply-chain services.

Components of DESH

Electronic Registries

- A single source of truth containing data about accredited/authorised agencies, authorised professionals, training centres, certified platforms on the discovery network, and other key stakeholders in the ecosystem.

Verifiable Credentials

- An electronic standard for data representing credentials, allows certificates to be awarded in a digital, machine-readable format and makes them digitally verifiable.

Open Protocol

- Open networks and open protocols for the skilling ecosystem enable interoperability over a nationwide, decentralised, open, secure and inclusive network.
- It brings service providers and users on a single open network reducing demand-supply gap in training and employment sector.

Process to verify credentials

A corporation creates a training credential for an individual



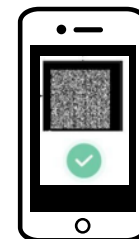
The aforesaid credential is added to the individual's credential repository



Individual uses his credential repository to apply for a job



The employer verifies credentials through the DESH-stack portal



IMPACT

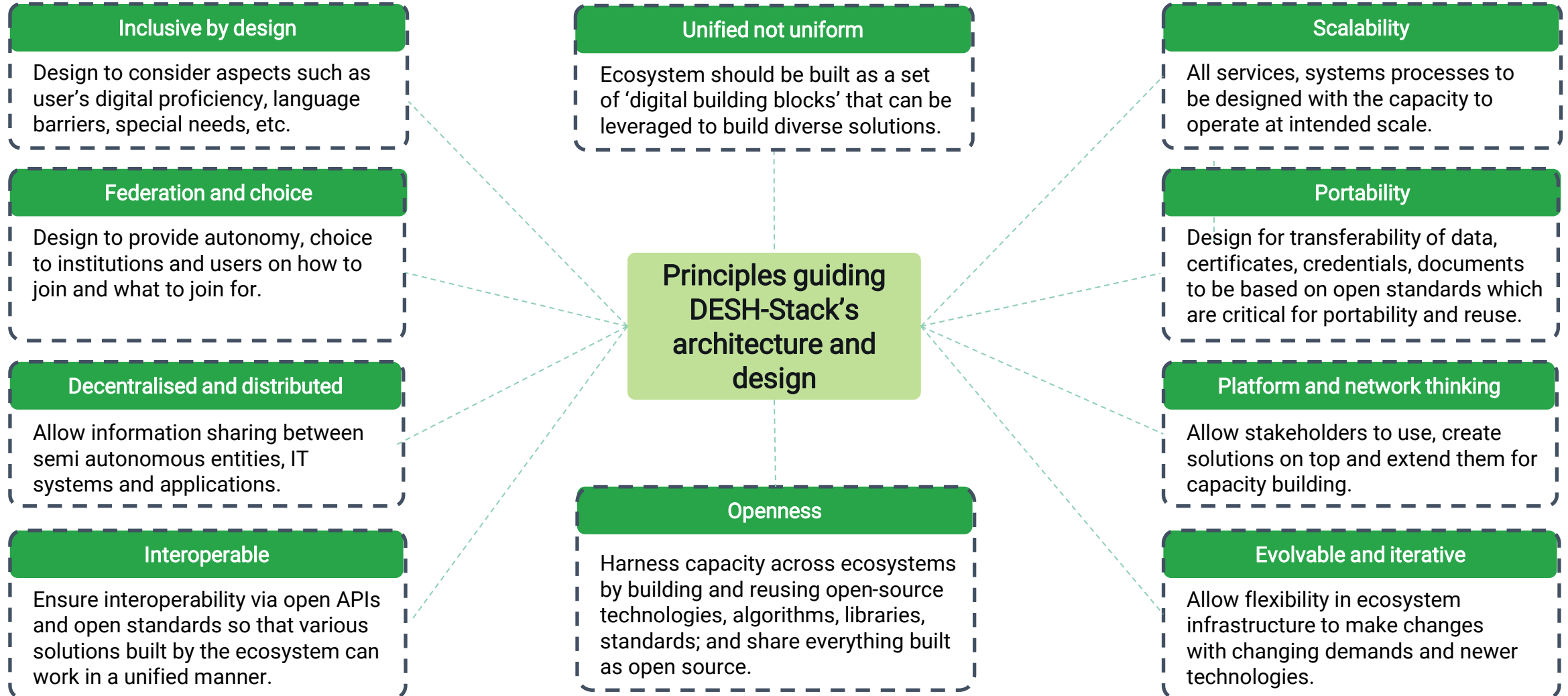
Enable any stakeholder to issue verifiable credentials reducing the information asymmetry and bringing trust in transactions.

Empower individuals to store verifiable credentials and act as a gateway for them to discover opportunities.

Facilitate individuals to discover skilling, training and job opportunities and employers to discover potential candidates.

Allow any stakeholder to be able to provide targeted financing for upskilling of individuals by using India stack.

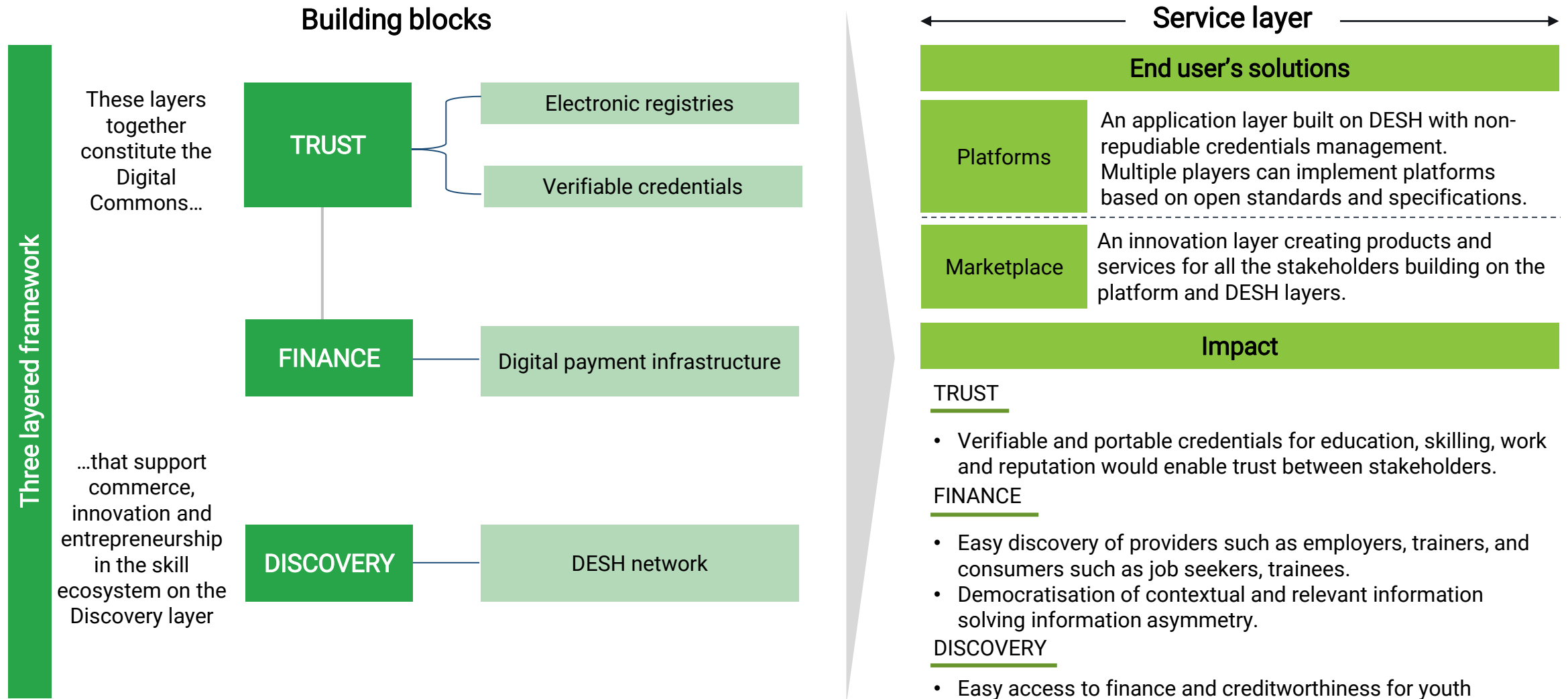
The architecture of the stack enables **solution development**, the solutions built over it work as a unified system.



DESH-STACK LAYERS



Trust, finance, and discovery form the three layers of the DESH-Stack.



The Trust layer facilitates an optimal supply and demand equilibrium by creating trust among the stakeholders through verifiable credentials.

Utility of the Trust Layer

- To enable any stakeholder to issue verifiable credentials reducing the information asymmetry and bringing trust in transactions
- To enable individuals to store verifiable credentials and act as a gateway for them to discover opportunities.

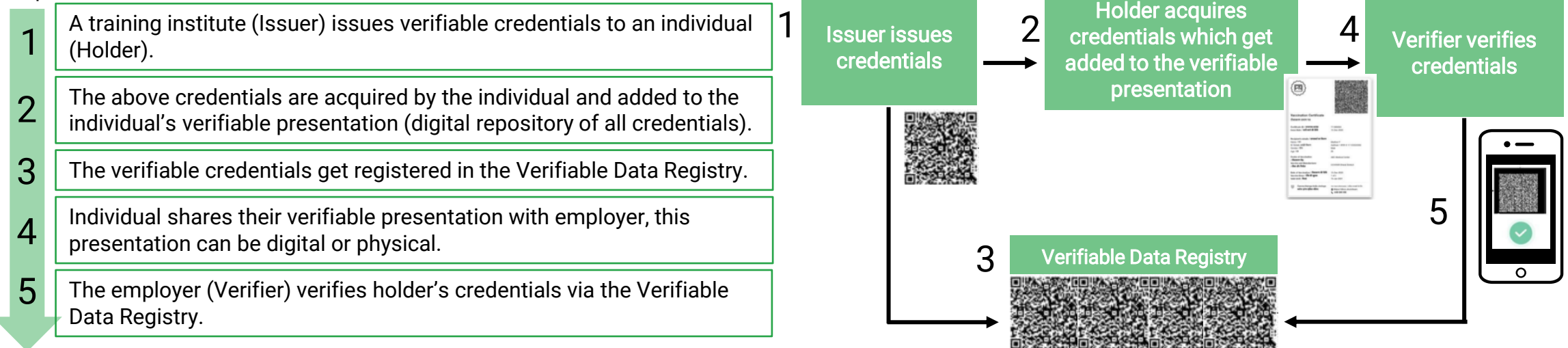
Electronic Registries

Electronic registries for accredited or authorised agencies, authorised professionals, training centres, certified platforms on the discovery network, and other key stakeholders in the ecosystem act as a source of truth.

Verifiable Credentials

An electronic standard for data representing credentials allows certificates to be awarded in a digital, machine-readable format and makes them digitally verifiable.

Verifiable Data Registry: Helps with the creation and verification of credentials by providing data and schemas (machine-readable format for data) that might be required to use verifiable credentials.

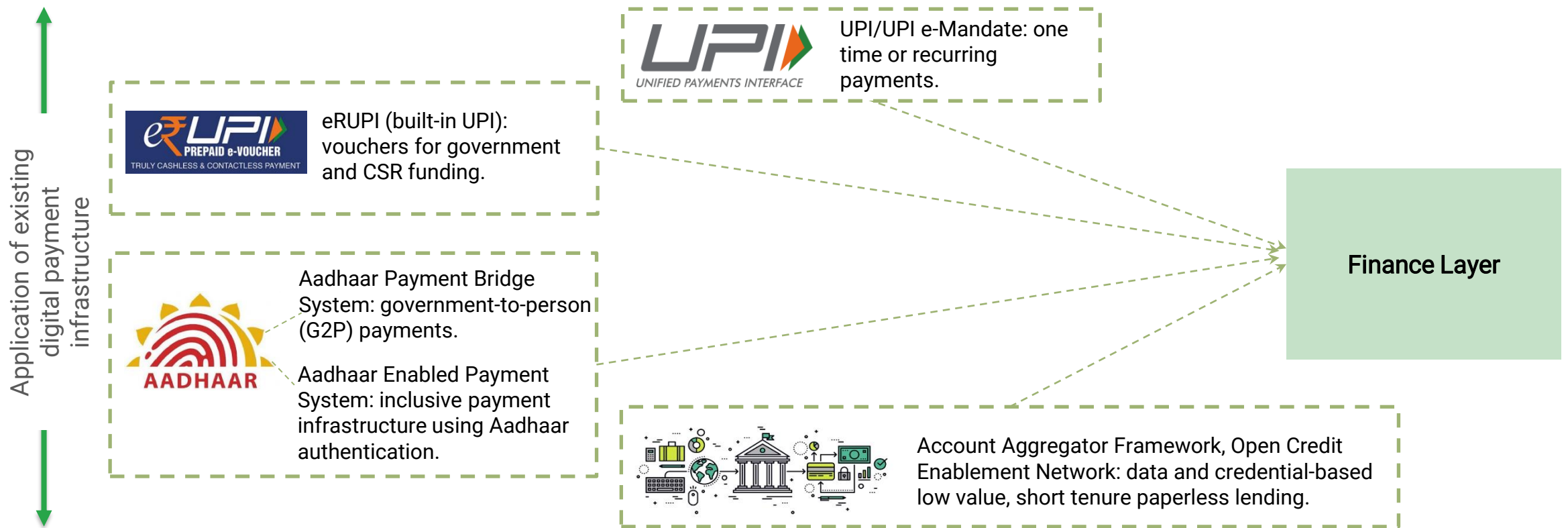


The Finance layer enables financial resource providers to target their resources to those in need, eliminating information asymmetry in the process.

Utility of the Finance Layer

- To support low-cost interactions and transactions between financial resource providers and organisations or individuals who need these resources.
- To provide easy access to finance and credit worthiness to youth and fix the disconnect between these stakeholders.
- To route scholarships and grants via existing payment infrastructure.

Most of the infrastructure for the layer is already built and DESH will leverage existing digital payment ecosystems

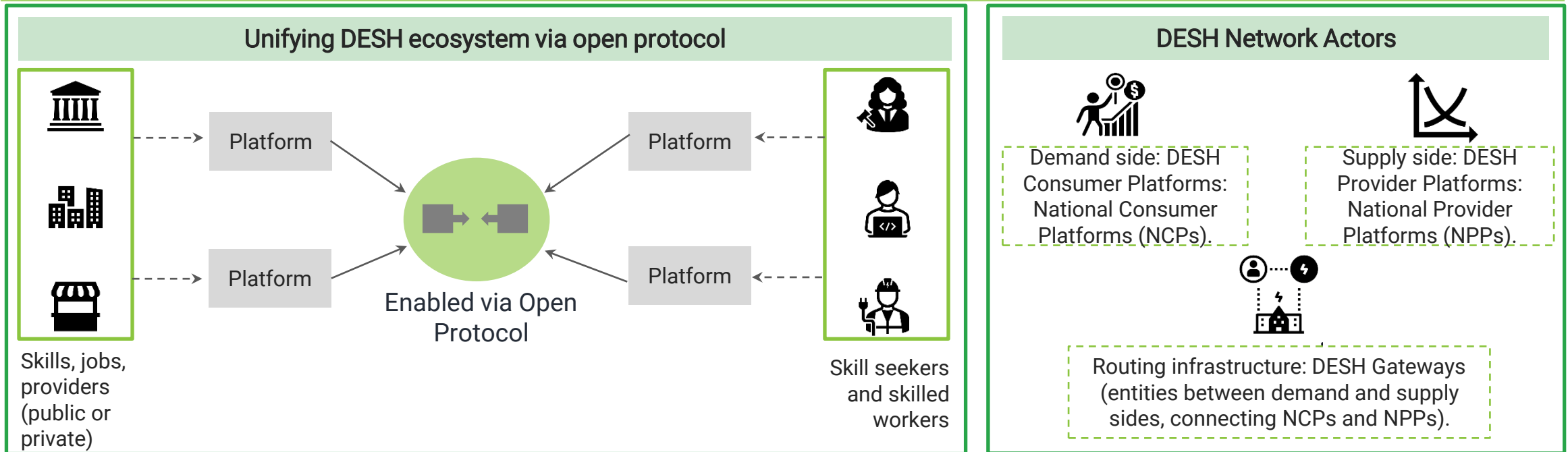


The Discovery layer connects various stakeholders on the portal and facilitates transactions across the network.

Utility of the Discovery Layer

- To enable discovery of skill development opportunities for candidates, of trainers for training organisations, and enable employers to locate prospective employees and vice versa.
- To empower providers as well as consumers of the ecosystem to transact across the DESH network.

- DESH Open network will be built on open protocols, that enable interoperability over a nationwide, decentralised, open, secure and inclusive network.
- DESH will adopt the Decentralised Skilling and Education Protocol (DESP) for the Discovery layer.
- DESP is currently being built and is extended on top of a decentralised network protocol, Beckn Protocol, which is also the core for other official government initiatives, such as the Unified Health Interface (UH) and the Open Network for Digital Commerce (ONDC).
- Enabling open access across diverse service providers and users can drastically expand demand-supply ecosystems.



Existing solutions in the ecosystem map to one or more aspects of the stack and DESH has the potential to bring them onto one network.

Trust Layer

Digital credential



- Affinidi specialises in creating and sharing digital identities, credentials and data for individuals and organisations.

CERTIFYME

- Certifyme is a SAAS-based start-up that provides an end-to-end solution for creating, issuing, and managing Digital Credentials.



- Truscholar is a blockchain-powered credential management platform. These digital credential solutions are Institutions that issue tamper-proof digital credentials and verify them instantly.



- Gyan Batua helps connect Digital Skill Learners with opportunities that require digital skills. Users gain coins in their skills wallet by participating in skills challenges and classes on the platform.

Finance Layer

Payment ecosystem



- DESH will leverage the existing digital payments ecosystem like Aadhaar Payment Bridge (APB), Aadhaar Enabled Payment System (AEPS), Unified Payment Interface (UPI), eRUPI built-in UPI, Account Aggregator (AA), and more.

Data exchange



- Dhiway provides verifiable data exchange platform delivering authenticity across institutional boundaries.

Discovery Layer

Open protocol



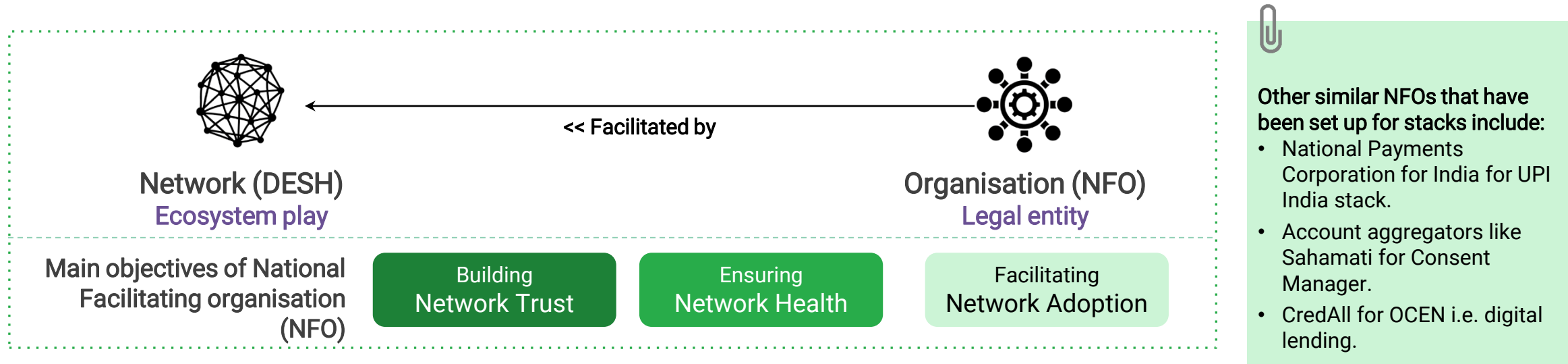
- Beckn Protocol is an open-source effort to build interoperable open protocol specifications as a public good.
- Some of its current partners include logistics startup Dunzo and B2B e-commerce firm ShopX.

Open source



- Open-source technology that provides configurable, customisable, and extendable services to creators and developers that want to build an education platform.

The government has set up National Facilitating Organisations (NFOs) for robust governance of the stack.



What will NFO do?

Network Registration

- Participant certification framework and services.
- Discovery registry services.

Network Operations

- Participant grievance and dispute resolution framework.
- Network health and performance monitoring framework.

Network Policy

- Network policy management: identification, evaluation and implementation.

Participant Management

- Participant registration services.
- Participant registration policy, procedure formulation and management.

Network Governance Board

- Participant network agreement.
- Governance board and electoral process, design and management.

Network Digital Commons

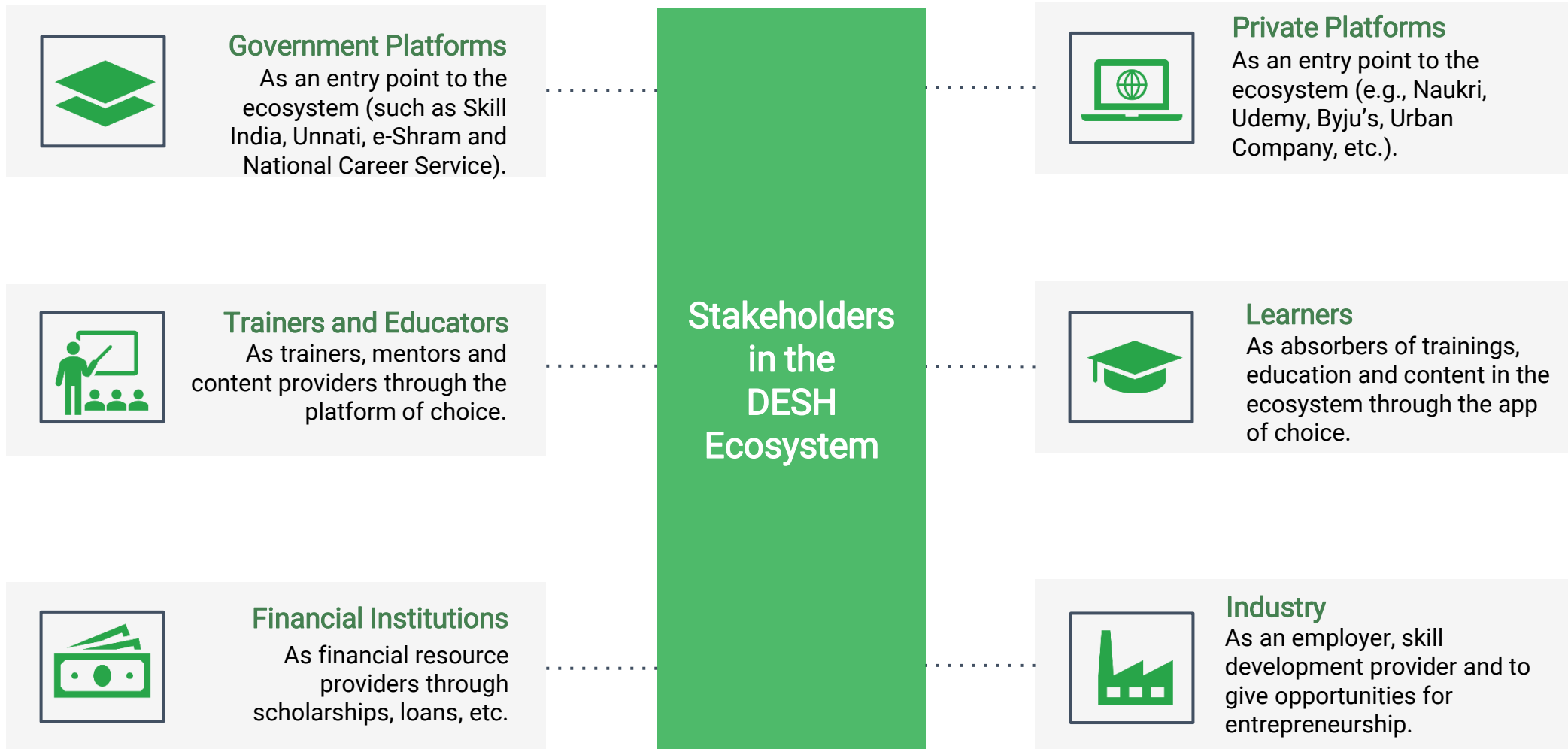
- Digital Commons adoption.
- Open community engagement.



STAKEHOLDER USE CASES



The stack connects all stakeholders in the skilling ecosystem to facilitate a collaborative environment.



DESH revolutionises the process of skill training, assessments and recruitment by making the platform a one-stop shop for relevant needs.

Current upskilling and livelihood processes

v/s

DESH-Stack's envisioned process

Skill Training



The individual has to register on multiple platforms to access courses offered by different institutes.

Once the individual completes the course, they get a paper certificate.

The individual has to present the original paper certificate to the employers.

Individuals get access to a larger number of training courses on a single platform as DESH will bring a large number of training institutes into one digital network.

Once an individual completes a course from a certain institute, the institute will transfer their new credential to the individual's digital skill repository.

Individual would be free to share this repository with employers.

Job Application



The individual has to register on multiple platforms to apply for jobs in different organisations.

The individual has to share their credentials in the form of a resume.

Employers manually compare these resumes which makes the process time-consuming and human capital intensive.

Employers verify credentials by asking for physical skill certificates and contacting respective training institutes or organisations for verification.

Individuals would be able to apply for relevant jobs in different organisations remotely via a single platform. DESH will bring different applications to one digital network.

Individuals will have the option to share their credentials with the employers in a digital form (verifiable representation) or physical form (print of verifiable representation).

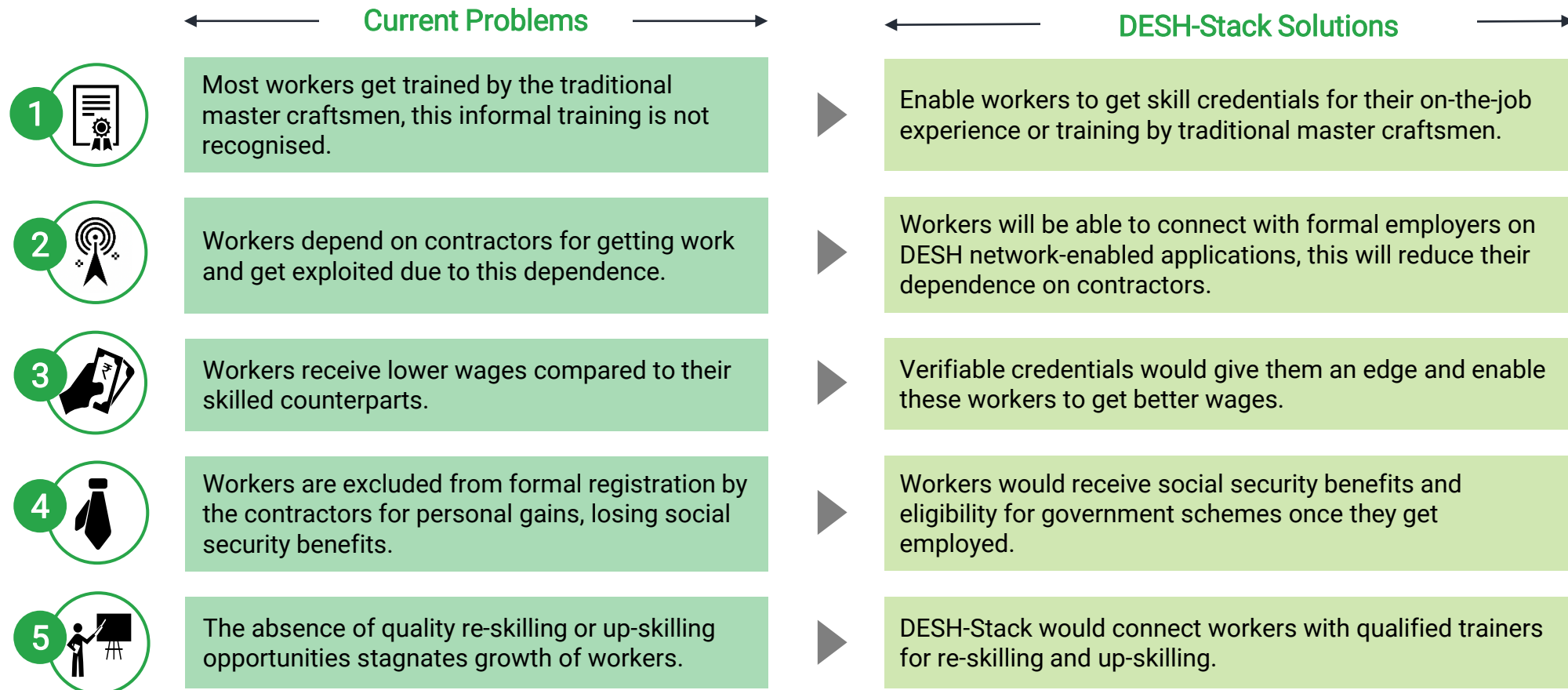
Employers will compare a large number of candidates digitally on a scale in a time-bound manner since their credentials would be available in a standard machine-readable format.

Employers will verify the credentials of prospective employees digitally, saving time and bringing trust in transactions.



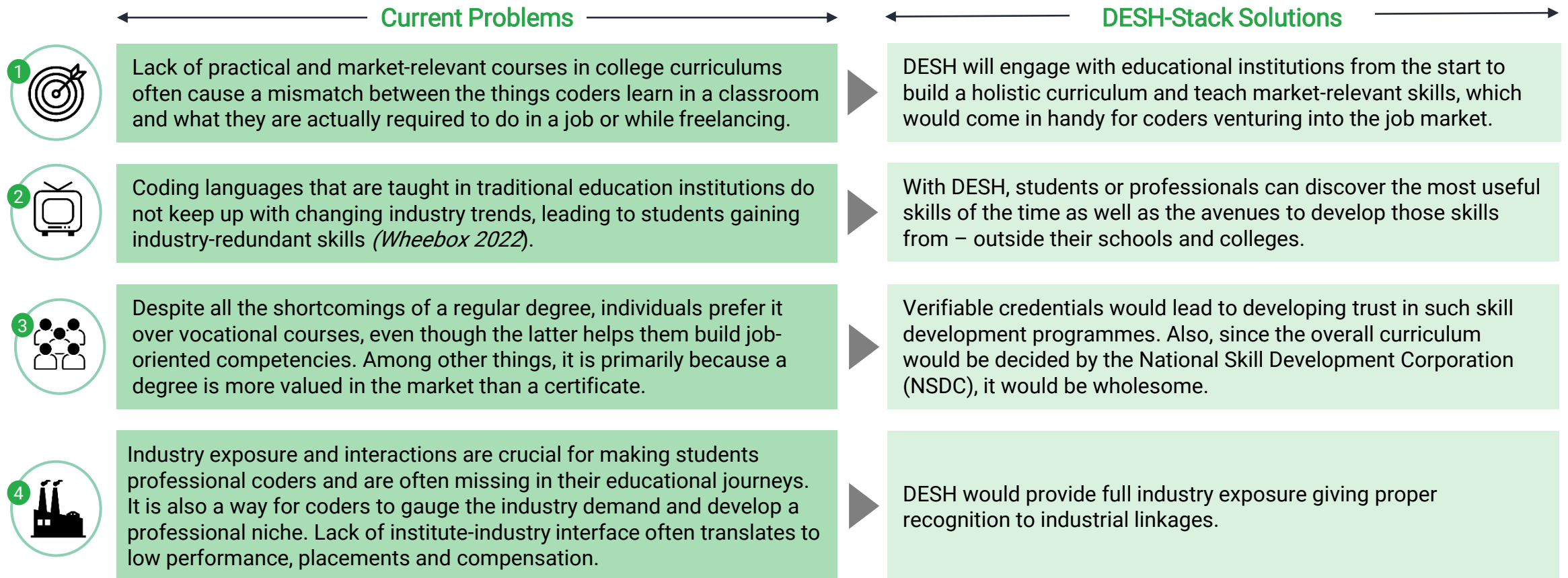
Formal training and verifiable credentials enable construction workers to identify better employment opportunities and improve their access to credit and government benefits.

The traditional system prevents construction workers from getting formal training and consequently, good work opportunities. DESH's skill training and its verifiable credentials would lend credibility to worker's performance and improve job prospects.



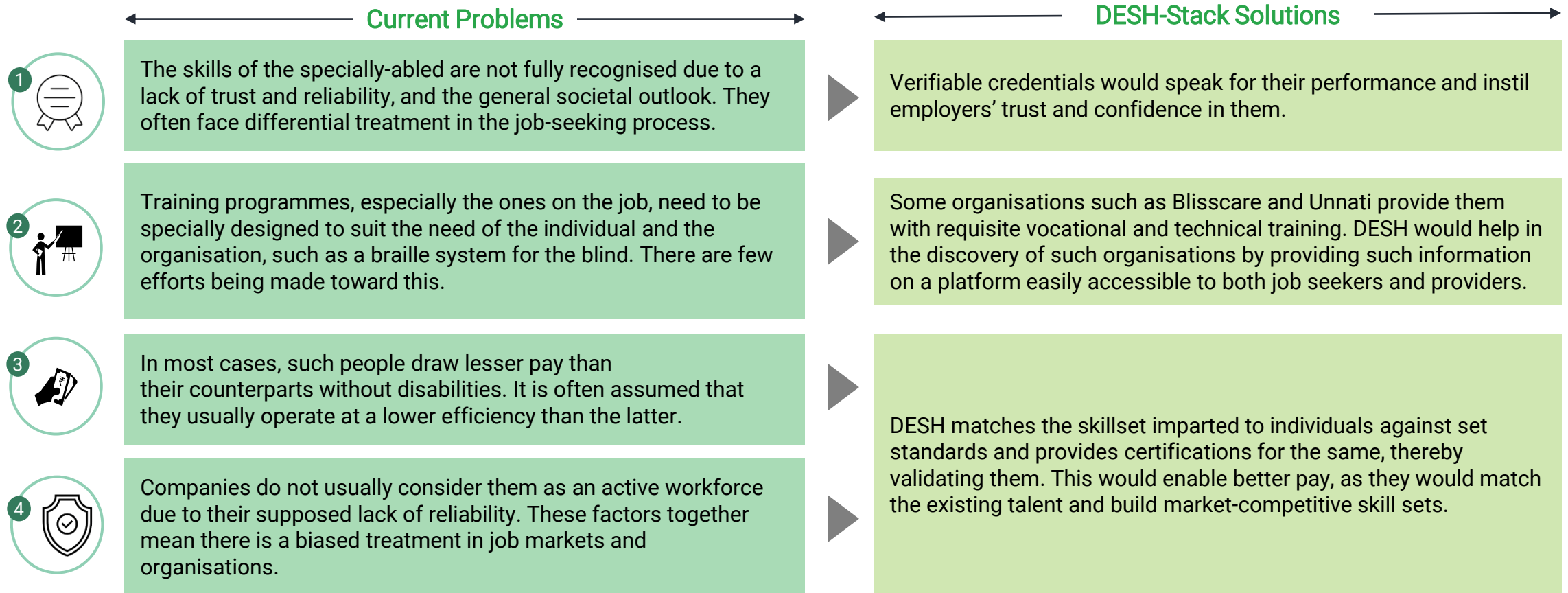
Access to all jobs on one portal helps in true assessment of market needs in the formal sector.

The traditional education and training system has a huge disconnect with industry skill requirements and trends. DESH can help coders discover skill trainers, employers and clients directly.



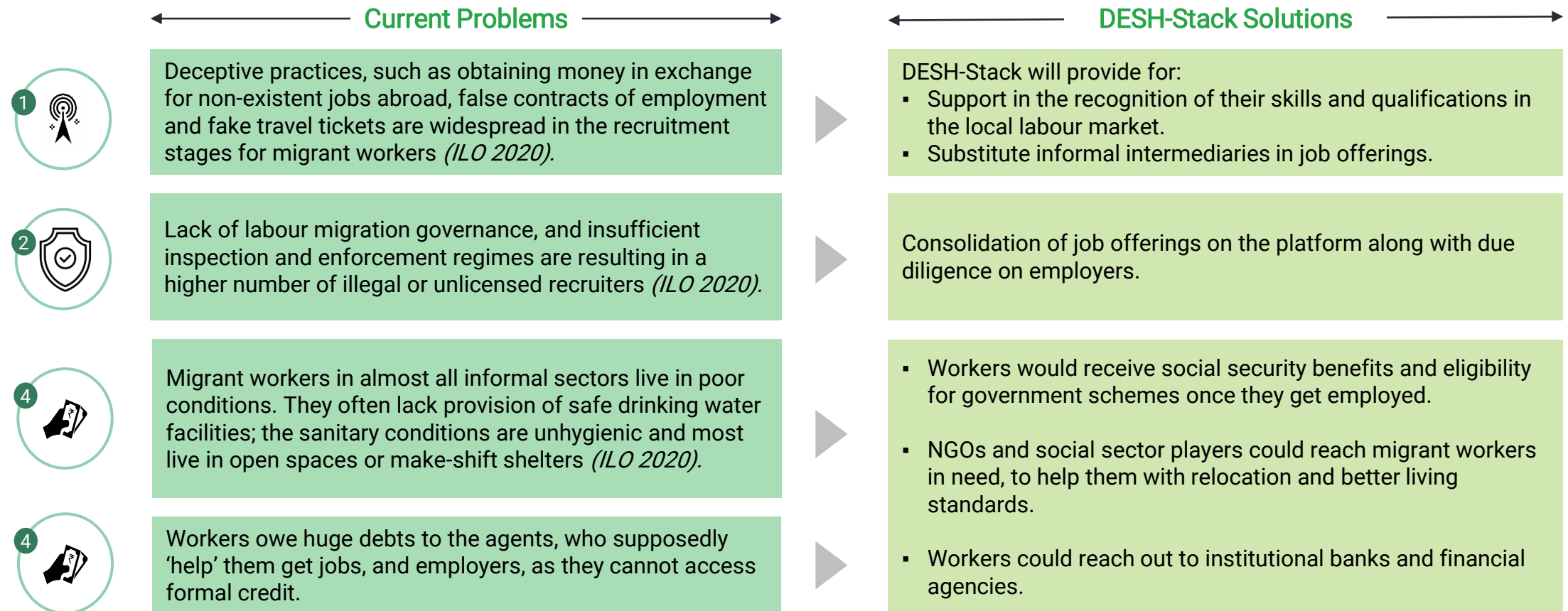
Increased discovery of special training and disability-friendly jobs will improve inclusion in the ecosystem.

Currently, people with disabilities are likely to face discrimination during skill-building and job-seeking processes, as well as in the workplace. DESH can help them find training modules and build their competitive skills, helping them to find valuable employment opportunities.



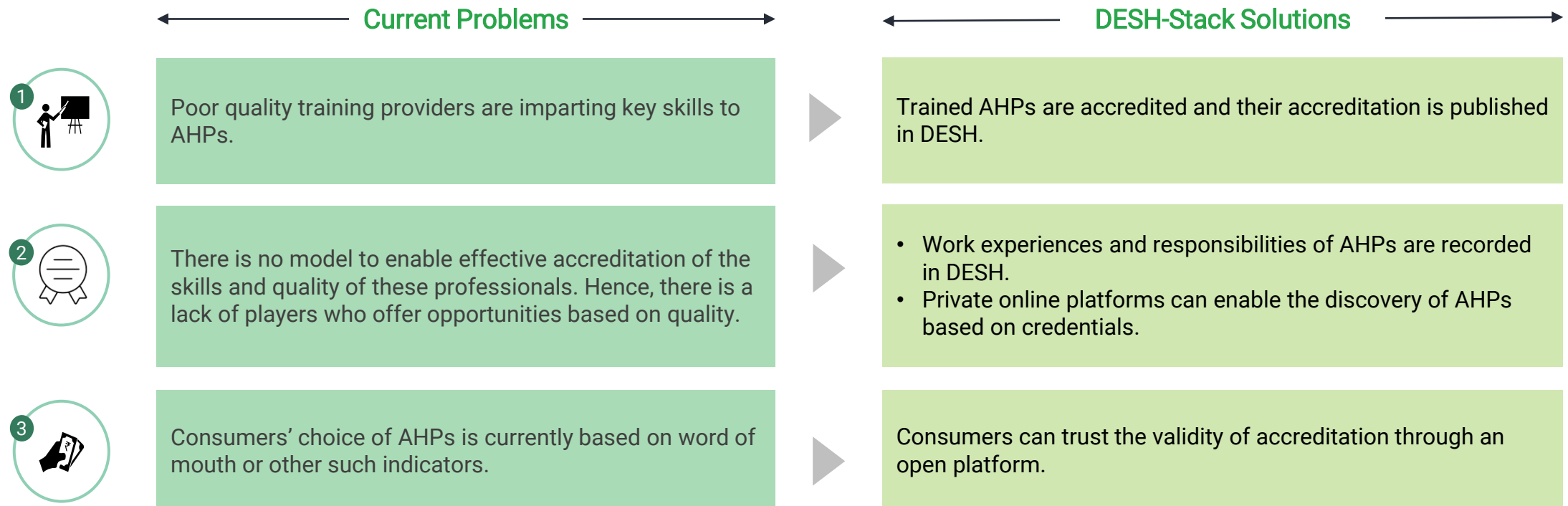
DESH-Stack solves deceptive practices in the migrant workers' recruitment processes by replacing illegal intermediaries.

Migrant workers are frequently exploited by unlicensed employers and intermediaries in the current job process. Most informal sector workers live in substandard conditions and earn below the minimum wage. DESH eliminates discrimination by offering credible jobs through the platform at decent wages.



Consumers make informed decisions based on health workers' credentials and achievements, replacing existing reliance on word-of-mouth recognition.

The DESH-Stack enables the recognition of quality allied health professionals (AHPs), which in the current model is based mostly on word-of-mouth.



ROLE OF PHILANTHROPIC ORGANISATIONS



Philanthropic organisations catalyse the adoption of the stack by fostering innovation, inclusivity and ecosystem building.

What can funders do to increase adoption of technology stacks

Foster innovation among builders	Support local and inclusive business models	Policy advocacy and ecosystem building	Capacity building of NGOs
<ul style="list-style-type: none"> • Fund incubators provide capital to innovators to develop low-cost and large-scale end-user solutions. • Organise innovation competitions that reward new approaches for serving poorer customers with funding to build and grow more inclusive products. 	<ul style="list-style-type: none"> • Support local innovations through market linkages, incubation or mentorship in local ecosystems, or grants. • Risk-sharing mechanisms such as first-loss guarantees, incentivise lenders to enter markets perceived to be of higher risk. 	<ul style="list-style-type: none"> • Support central and state governments with technical assistance and programme design, and set up national standards for data privacy. • Collaborate with relevant private sector industries to create win-win outcomes. • Build inclusive schemes with the government based on evidence of these solutions. 	<ul style="list-style-type: none"> • Strengthen ICT infrastructure and know-how among NGOs to enable them to participate in digital public goods. • Promote the use of open-source technologies for NGOs to develop low-cost applications. • Build toolkits for technology adoption in NGOs.

Applying these to DESH-Stack

<ul style="list-style-type: none"> • Foster innovation of skilling products that cater to the local rural economy to sustain the local livelihood ecosystem. This could solve for increased domestic migration within the country. • Incentivise private sectors to produce solutions for the non-profitable sections. 	<ul style="list-style-type: none"> • Build strategies for returning migrants to secure decent jobs back home or enable them to start successful businesses with support in market linkages. • Invest in innovative financing mechanisms to support skilled trainers in their entrepreneurial ventures and students in need of financial aid. 	<ul style="list-style-type: none"> • Along with the Government, funders could execute and influence better safety net and social protection programmes. • Promote new-age jobs like green jobs and skilling with the support of the government and private industries. Funders can incentivise green entrepreneurs, and work with industries for placements. 	<ul style="list-style-type: none"> • Support NGOs in adopting the platform and act as further nodes to increase adoption. • Trained NGOs can work with trade unions, community youth groups and other such community organisations to increase adoption of the stack among users.
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