From Stone and Thread to Shared Intelligence

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Part V - The Value: Useful Outcomes and Measurable Participation

A Credit-Card-Sized Starting Point for Local Making and Global Participation

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Human Authority · Local Capability · Global Participation
No One Left Behind in the GenAI Physical Era

Part V at a glance

Parts I-IV moved from opportunity, to existing capabilities, to accountable collaboration, and then to an engineering path that allows multiple teams to develop together before final hardware is shipped. Part V asks the next question: **what useful value is actually created, for whom, and how can that value be measured without counting the same benefit several times?**

This is where a white paper can easily become vague. It is simple to say that a project supports sustainability, saves labour, improves inclusion, creates innovation, reduces waste and contributes to many Sustainable Development Goals. It is harder to show which result happened, which participant benefited, which participant carried a new burden, which cash flow actually changed, which material or energy flow changed, and what evidence supports the claim.

HSIMC therefore treats value as a set of observed changes, not as a marketing adjective.

A useful Work should make it possible to answer at least five questions:

1. **Outcome** - What changed in the physical or service world?
2. **Participant value** - Who gained time, income, capability, access, convenience or reduced risk?
3. **Participant cost** - Who contributed cash, labour, equipment time, materials, attention or responsibility?
4. **Evidence** - What baseline, receipt, measurement or acceptance record supports the result?

5. **Distribution** - Was the benefit shared fairly enough that the system can continue without shifting hidden cost to another participant?

This Part develops that approach in three chapters.

Chapter 13 follows three classes of real-world journeys: **make, move and assist**. These are not claims that every proposed HSIMC application has already been deployed. They are reference patterns for organizing Work, custody, Authority and Evidence. Where adjacent services already exist, such as airport baggage delivery, smart baggage tags and trolley monitoring, the text identifies them as external evidence rather than as HSIMC deployments.

Chapter 14 defines a practical value-accounting method. It separates cash results, released capability, user/service outcomes, environmental effects and governance evidence. It also distinguishes participant-level accounting from network-level accounting so that a payment from one participant to another is not counted twice as new value. For greenhouse-gas claims, it separates organization inventories from project/intervention effects and treats avoided-emission claims as a separate analytical layer rather than subtracting them casually from a footprint.

Chapter 15 maps the work against all 17 United Nations Sustainable Development Goals. The purpose is not to claim that one platform "achieves" 17 Goals. The purpose is to state where a contribution may be relevant, what evidence would be required, and where the relevance remains conditional. The strongest initial connections are expected to be around skills, decent work, inclusive industrial participation, reduced inequalities, responsible production and multi-stakeholder partnerships. Other Goals become relevant only when a concrete application creates the corresponding outcome.

The value principle of this Part is:

> **Count the change once. Show who received it. Show who paid for it. Keep the evidence close to the Work.**

Chapter 13 - Real-World Journeys: Make, Move and Assist

13.1 Make: from available material to accepted output

The most basic real-world journey is transformation.

A material, part, file or object begins in one state. A person, machine or process changes it. Another party accepts the result. The economic value is not created simply because a machine was switched on. It is created when a requested result reaches a condition that someone is prepared to accept and use.

A useful manufacturing Work therefore has more structure than a purchase order line.

A minimal chain is:

Demand → confirmed input → preparation → process → inspection → accepted output → storage or next handover

Each transition can be represented by a different responsible party and a different type of evidence.

For a small printed or embroidered interface, for example:

- the demand defines the pattern, quantity, substrate, tolerance and delivery window;
- the material record identifies the substrate, thread, ink, film, laminate or other input actually used;
- preparation records the file version, machine settings, fixture and operator;
- the process record identifies the machine or maker and the time window;
- inspection returns dimensions, resistance, image evidence, read/write result or another relevant acceptance measure;
- the accepted-output record identifies who accepted the sample and under which version;
- storage or delivery records where the accepted items went next.

That structure makes it possible for a very small producer to participate without pretending to be a fully integrated electronics company.

A sewing or embroidery workshop may provide the controlled placement step. A print shop may produce registration marks or a functional surface. A hardware team may provide the NFC or sensor module. A remote engineer may provide image inspection or test vectors. A local integrator may make the connector or fixture. The customer may accept the integrated result.

The commercial unit is therefore not "one factory". It can be **one accepted transformation** assembled from multiple capabilities.

Demand, inventory and process should remain distinct

A common failure in digital manufacturing systems is to treat three different statements as if they were equivalent:

- "the customer wants ten units";
- "the material is available";
- "the machine can produce ten units before the deadline".

They are not equivalent.

Demand describes a requested future result. Inventory describes a material or object state at a particular observation time. Capability describes what a Resource may be able to do under specified conditions. A commitment is created only when an authorized provider accepts a Work against a sufficiently current view of those conditions.

This distinction becomes especially important in a stateless collaboration model. The client should be able to re-submit the context needed to understand a request, but the material reservation, machine booking, accepted Work and operation receipt remain persistent business facts.

Low frequency can still create a valuable shared network

Part I introduced a recurring observation from small industrial spaces: a single factory may need a movement or production capability only occasionally. That does not mean the capability has no market.

The more useful question is whether many low-frequency users can share a capability without unacceptable conflicts.

For a shared machine, fixture, power module or inspection station, the relevant variables include:

- setup and teardown time;
- travel or transfer time between users;
- minimum useful batch size;
- preparation requirements;
- operator availability;
- maintenance window;
- storage requirement;
- deadline overlap;
- failure and rework probability.

The business opportunity is not merely to sell more hardware. It may be to make existing hardware, skill and space easier to schedule and trust.

A local maker who can return a verified sample in two hours may create more value for a fast iteration than a remote supplier with a lower unit price but a five-day feedback loop. The correct comparison is the **full cost of reaching an accepted result**, including waiting, failed iterations, communication and rework.

A transformation evidence packet

A reproducible manufacturing Work should eventually be able to produce a compact evidence packet containing, as appropriate:

- Work ID and accepted version;
- responsible requester, provider and acceptor;
- input identity and observed quantity;
- material batch or source reference;

- machine / tool / process Profile;
- process parameters that materially affect the result;
- start and completion timestamps;
- inspection result and uncertainty where relevant;
- rejected or reworked quantity;
- accepted quantity;
- actual direct cost and time;
- next custody or storage location.

Not every local maker needs to operate this data model directly. A phone, card, QR/NFC entry or HSIMC assistant can translate a simple local interaction into a structured record.

That is the practical meaning of making local capability globally usable: **the person does not need to become a software platform; the contribution needs a reliable interface and evidence.**

13.2 Move: from warehouse to machine, airport to hotel, and one custodian to another

Movement creates value when an object reaches the right place, at the right time, under the right custody and condition.

A route alone is not enough.

For a warehouse-to-machine Work, the relevant state change may be:

available stock → reserved stock → picked → in transit → received at machine → consumed or returned

For finished goods it may be:

accepted output → stored → released → handed to carrier → received by next custodian

For travel baggage it may be:

passenger has bag → bag accepted for service → bag in custody → bag arrives at hotel or storage point → guest chooses receiving time → final handover

Each step has a different Authority and different evidence.

Existing travel services show that the pieces already exist

Hong Kong International Airport currently lists paid baggage delivery services that can move baggage between the airport and a passenger's hotel, home or designated downtown location, depending on the provider. This proves that airport-to-hotel baggage movement is already a purchasable service category; it does not prove the HSIMC proposed timing and handover model has been deployed.

HKIA also operates MyTAG, an RFID smart baggage tag that can notify a passenger through the My HKG app when a bag is ready for pickup. The MyTAG service uses tag registration plus flight information, and its support documentation describes scanning the tag QR code and linking the tag to a flight. HKIA also describes a real-time trolley monitoring and tracking system for keeping baggage trolleys available at appropriate locations.

These examples matter because they show that identity, tracking, booking, baggage movement and trolley availability are already separate operational capabilities. A new service does not need to reinvent every layer. It can focus on the missing handover between existing layers.

The proposed airport-hotel journey

The HSIMC concept separates three states that are often collapsed:

- **Room ready** - the hotel room is available;
- **Bag ready** - the baggage has reached an agreed receiving or storage point;
- **Guest ready** - the guest wants the final handover now or within an accepted time window.

This distinction is operationally important.

A guest may arrive before the baggage. A bag may arrive while the guest is showering, sleeping, in a meeting or simply not ready to answer the door. A hotel may have luggage storage but no bell service at a particular hour. An economy hotel may have minimal staff. A person with heavy work equipment may value assistance even when the room rate is low.

The proposed service therefore does not assume that "bag at hotel" means "deliver immediately to room".

A more respectful sequence is:

1. the transport provider hands the bag to an authorized hotel or storage receiver;
2. the bag becomes **Bag ready**;
3. the guest receives a quiet digital notice;
4. the guest chooses now, a time window, continued storage, or an agreed pickup point;
5. a provider accepts the final handover Work;
6. the bag is handed over and the custody record closes.

The value can then be measured as more than transport distance. It includes fewer unsuccessful room visits, less unwanted interruption, clearer staffing, clearer pricing and potentially better access to luggage assistance in hotels that do not provide traditional bell service.

Identity is not custody

Barcodes, airline baggage identifiers, UHF RFID, QR and NFC can help identify or associate an object. They do not by themselves prove who currently holds the bag or who is authorized to move it.

A service record should therefore separate:

- observed tag / barcode identifier;
- internal bag object identity for the service;
- current custodian;
- requested destination;
- accepted next handover;
- guest or owner Authority;
- service status;
- completed handover evidence.

The same principle applies to warehouse materials, returned equipment, exhibition crates and shared carts.

The proposed airport trolley journey

Another proposed journey is the empty trolley after a passenger reaches a boundary where the trolley cannot or should not continue.

The first useful outcome is not "perfectly organize every trolley". It may simply be:

> **Move the released trolley away from a high-friction handover point quickly enough that the space becomes available to the next traveler.**

That outcome can be measured directly:

- time from traveler release to cleared space;
- number of trolleys blocking the handover point;
- worker minutes required per cleared trolley;
- secondary congestion created at the temporary holding point;
- retrieval time from temporary holding to normal trolley pool.

Automation is only one possible execution mode. Human collection, powered assistance, a clip-on module or a future autonomous unit can all be compared against the same outcome.

This is an important pattern for HSIMC: **define the outcome before deciding which machine should own it.**

AI is already entering the travel planning layer

IATA's 2026 Global Passenger Survey reports that 49% of respondents had used AI for travel planning, based on more than 10,000 responses from over 200 countries. The report explicitly notes the importance of connecting AI conversations to real booking and service flows.

That makes the physical handover layer increasingly important. An AI may help a traveler decide what they want. The value gap remains whether an authorized local provider can accept the requested Work and complete it.

13.3 Assist: make existing mobility and work easier without collapsing safety boundaries

"Assist" covers a wider class of outcomes than manufacturing or logistics.

The user may be a worker moving a heavy cart, an older person using a wheelchair, a hotel employee moving linen, a researcher moving equipment, or a person who simply needs a task to require less physical effort.

The opportunity is attractive because many existing assets already perform most of their function well.

A wheelchair already supports the person. A hotel bell cart already carries luggage. A trolley already rolls. A pallet already supports goods. A sewing machine already places thread. A print shop already controls registration. The proposed innovation may be an additional capability that can be attached, borrowed, scheduled or removed.

This leads to a general rule:

> **Upgrade the missing capability before replacing the whole asset.**

Assistance must preserve the difference between person and cargo

A cargo cart and an occupied wheelchair may use related positioning, power, communication or evidence infrastructure. They do not share the same safety case.

A successful empty-cart movement cannot be used as evidence that an occupied wheelchair is safe. A UWB position estimate cannot, by itself, authorize movement. A software stop request cannot substitute for a verified braking and recovery design. A clip-on mechanical interface that works on a pallet does not prove compatibility with a wheelchair frame.

Any assistive-mobility branch therefore needs its own:

- user and caregiver roles;

- mechanical load and stability tests;
- braking and hill-hold behavior;
- speed and acceleration limits;
- obstacle and drop-off handling;
- manual takeover method;
- battery and charging conditions;
- fault response;
- environment and route constraints;
- local regulatory and operator requirements;
- user acceptance and dignity considerations.

The shared HSIMC layer is the contract, Authority, Resource discovery and Evidence method. The physical safety evidence remains application-specific.

Human effort is not automatically a cost to eliminate

An inclusive system should avoid treating every minute of human work as waste.

Some work is skilled, socially valuable and a source of income. Some human presence is a safety control, a service relationship or a form of dignity. The question is not simply "how many people can the machine replace?"

The better questions are:

- Which task is physically burdensome or repetitive?
- Which task requires judgment, trust or human interaction?
- Can a tool allow one person to do safer or higher-value work?
- Does released time actually reduce paid overtime or enable more paid service?
- Does the change remove an earning opportunity without creating another pathway?
- Who decides whether the assistance is desirable?

This connects directly to the "No One Left Behind" principle. A physical GenAI system should not create value for one party by making another party's work invisible.

Measure dignity and choice where they are part of the service

For baggage, assistance and hospitality, value may include the ability to choose when an interaction occurs.

For mobility, value may include reduced physical strain, greater independent movement or easier caregiver support.

For local makers, value may include access to work that previously required a larger company or a distant engineering team.

These are real outcomes, but they require appropriate measures. A project should not convert every social benefit into a fictional dollar amount merely to make the spreadsheet look complete.

Some value should remain in its natural unit:

- minutes of unwanted interruption avoided;
- kilograms or meters of manual handling avoided;
- percentage of requested time windows met;
- number of people newly able to perform a task;
- number of makers who can independently reproduce a function;
- number of participants receiving paid work;
- user-reported ease or confidence under a defined survey method.

Part V therefore uses multiple ledgers rather than forcing every result into one financial number.

Chapter 14 - Measuring Value without Double Counting

14.1 Separate the ledgers before combining the story

A multi-party system can create confusion because the same event appears differently to each participant.

If a hotel pays HKD 100 to a baggage-service provider, the hotel sees HKD 100 of cost and the provider sees HKD 100 of revenue. If a joint report adds both values as "HKD 200 of economic value created", it has counted the same transfer twice.

If an automation saves 20 worker-minutes but no worker leaves early, no overtime is reduced and no additional paid service is completed, the project has released capacity. It has not yet demonstrated a cash amount of cash savings.

If a recycled material replaces virgin material in one component, the project should not automatically claim the full avoided emissions of an entire product unless the system boundary, baseline and life-cycle effects support that conclusion.

HSIMC therefore uses several ledgers.

Ledger 1 - Cash

Record actual incremental cash flows for each participant.

For participant *j* during period *t*:

Incremental cash contribution(j,t) = new cash revenue + verified avoided cash expense - new operating cash expense

Initial integration or equipment investment is recorded separately.

A simple period ROI can then be calculated as:

ROI(j) = (sum incremental cash contribution - initial investment) / initial investment

when initial investment is greater than zero.

If the investment is zero or primarily in-kind, report net cash contribution and in-kind contribution rather than forcing an undefined ROI ratio.

Cash evidence should come from actual invoices, payroll/overtime changes, supplier invoices, paid service orders or another auditable record. A model estimate can be shown as a forecast but should not be relabeled as realized cash.

Ledger 2 - Released capability

Measure capacity in operational units.

Examples include:

- worker minutes released;
- machine minutes newly usable;
- queue time reduced;
- additional jobs completed within the same shift;
- faster sample iteration;
- shorter time from design freeze to visible sample;
- shorter time from release package to second-site reproduction;
- more storage positions usable;
- fewer unsuccessful handover attempts.

Released capability can later cause a cash effect. Until that effect occurs, it remains an operational result.

Ledger 3 - User and service outcome

Measure the outcome in terms that matter to the user or operator.

Examples include:

- percentage of deliveries completed in the requested time window;
- minutes a trolley blocks a transfer point;
- number of re-deliveries or failed handovers;
- user-selected delivery method;
- travel or walking distance avoided;
- successful accessibility assistance requests;
- defect or rework rate;
- time to find the correct material or tool;
- time to recover from a failed operation.

This ledger prevents the project from optimizing a technical metric that the user does not value.

Ledger 4 - Environmental and material effect

Record actual material and energy flows before making a sustainability claim.

Possible measures include:

- mass of reused material;
- mass and type of new material added;
- failed sample and scrap mass;
- packaging material;
- electricity consumed in processing;
- battery charging energy;
- transport distance or service movements;
- repaired or extended-life assets;
- product or component lifetime;
- end-of-life route where known.

The GHG Protocol Product Standard is useful as a reference because it frames product life-cycle emissions across raw materials, manufacturing, transportation, storage, use and disposal. That breadth is important: local reuse may reduce one material flow while adding processing energy, transport or an electronic component elsewhere.

Ledger 5 - Governance and evidence

Record whether the system actually operated under the promised Authority and accountability model.

Examples include:

- percentage of physical actions linked to an accepted Work ID;
- percentage of deliveries with a completed custody record;

- operations rejected because Authority was missing or expired;
- duplicate requests correctly resolved without repeating a physical action;
- stop/recovery requests with confirmed outcomes;
- evidence completeness by Work type;
- payment disputes and resolution time;
- number of participants able to inspect the evidence relevant to them.

Governance is not a decorative ESG category. It determines whether the other ledgers can be trusted.

14.2 Baseline, attribution and the difference between transfer and creation

Value measurement needs a baseline.

Without a baseline, "saved time" is merely a description of a new process. Without a baseline, "reduced waste" may reflect a smaller order rather than a better process. Without a baseline, "higher productivity" may be caused by a different product mix.

A practical Work should therefore record, where feasible:

- baseline period or baseline method;
- planned result;
- provider commitment;
- actual result;
- variance;
- known external changes;
- confidence or uncertainty where important.

The baseline does not always need to be sophisticated. For a small workshop it may be three observed manual runs before introducing an assistance tool. For baggage delivery it may be the historical number of failed or unwanted handovers. For sample iteration it may be the time from design change to measurable sample under the previous process.

Participant accounting and network accounting are different

At participant level, a payment is economically real.

At consolidated network level, a payment between two participants is a transfer. It should be eliminated if the purpose is to estimate net value created by the network as a whole.

A useful consolidated equation is:

Network net cash contribution = external revenue + verified avoided external cash cost - new external operating cost

Internal payments between included participants are eliminated in consolidation.

This is similar in spirit to eliminating intercompany transactions in consolidated financial statements, although this white paper does not propose a new accounting standard.

A time saving is not automatically a wage saving

Suppose a worker previously spent 30 minutes pushing a cart and now spends 10 minutes supervising an assisted movement.

The project has released 20 minutes of capacity.

Possible next outcomes include:

- the worker finishes the shift earlier and overtime falls;
- the worker completes another paid delivery;
- the worker performs quality control instead;
- the worker waits because no other task is available;
- the employer reduces staffing;
- the service improves without changing staffing.

Those are materially different social and financial outcomes.

The system should therefore preserve the operational result first, then observe what happens to cash, workload, service quality and employment.

Avoid counting the same environmental benefit twice

GHG Protocol guidance distinguishes organization-level inventory accounting from project/intervention accounting.

Inventory accounting describes emissions associated with an organization's defined boundary and value chain. Project accounting estimates the effect of a specific intervention relative to a counterfactual baseline. The two methods answer different questions.

This distinction is especially useful for HSIMC.

If a local project reuses an existing pallet, reduces a transport movement or extends the useful life of equipment, the project may estimate an intervention effect relative to an appropriate baseline. That result should not automatically be subtracted from every participating organization's Scope 1, 2 or 3 inventory. Avoided-emission estimates should be shown separately and with their assumptions.

The GHG Protocol also emphasizes avoiding or transparently handling double counting in comparative and crediting contexts. The practical HSIMC rule is:

> **Report the physical change, the inventory effect and any estimated avoided effect as separate facts unless a recognized method explicitly connects them.**

Attribution should follow the evidence, not the loudest brand

Multi-party Work creates another risk: one organization may claim the whole result even though several parties made it possible.

A more credible record separates:

- the party that defined the demand;
- the party that supplied the material;
- the maker or operator;
- the model or software contributor;
- the equipment owner;
- the site provider;
- the logistics provider;
- the funder or sponsor;
- the acceptor;
- the party responsible for measurement.

A published case can then describe contribution without pretending that every participant caused the entire outcome alone.

14.3 Decide what to scale by comparing marginal value with marginal burden

The purpose of measurement is not reporting for its own sake. It is to make better next decisions.

A project can therefore use staged investment gates.

Gate 1 - Is the problem observable?

Can the team measure the current delay, cost, burden, defect or access problem?

If not, the first Work may simply be a baseline observation.

Gate 2 - Can a minimal service improve the result without new custom hardware?

Use existing people, QR, phones, available tags, manual confirmation, borrowed tools or existing logistics where appropriate.

This identifies whether the service concept has value before expensive automation.

Gate 3 - Does an added tool improve the full outcome?

Introduce a fixture, reader, UWB module, clip-on power unit, T736 adapter or software automation.

Measure:

- new direct cost;
- failure and intervention rate;
- time saved;
- additional demand served;
- user outcome;
- safety or governance burden;
- maintenance requirement.

Gate 4 - Does sharing improve utilization without creating coordination cost that cancels the benefit?

A shared asset has a second-order cost: reservation, travel, setup, return, charging, cleaning, maintenance and conflict management.

The relevant utilization metric is not simply "percentage of day powered on". It may be:

useful accepted Work / total capability cost

A low-utilization asset can still be rational if the alternative is extremely costly, urgent or inaccessible. Conversely, a frequently used asset can be a poor investment if failures and supervision are high.

Gate 5 - Can a second site reproduce the value?

Replication should reproduce both the function and the accounting logic.

A second site should be able to state:

- what stayed the same;
- what changed locally;
- what cost changed;
- what acceptance measure changed;
- whether the original benefit remained;
- which new burden appeared.

This is the difference between a demonstration and a scalable method.

A practical value dashboard

A compact Work-level dashboard can therefore show:

Dimension	Example measure	Evidence source
Outcome	accepted units / completed handovers	acceptance receipt
Cash	external revenue, avoided external expense, operating cost	invoice / payroll / supplier record
Capacity	minutes released, jobs added, queue reduced	timestamped workflow
User	time-window success, interruption, accessibility	service record / survey
Material	reused mass, scrap, added material	batch / weight record
Energy	kWh or battery cycles where material	meter / charger / estimate with method
Governance	authorized actions, duplicate handling, recovery	operation ledger
Replication	time to reproduce at second site	release and acceptance records

The dashboard should not be used to compress all dimensions into a single score unless the weighting method and purpose are explicit.

A business can make money while creating a social burden. A project can produce an environmental benefit while losing money. A service can improve user dignity without reducing labour cost. A training programme can create capability before it creates revenue.

The value model should make these differences visible rather than hide them.

Chapter 15 - Seventeen Goals, Specific Contributions

15.1 Use the SDGs as a relevance and evidence map, not as a badge collection

The United Nations 2030 Agenda describes 17 Sustainable Development Goals and 169 targets as integrated and indivisible. It also commits to leave no one behind and to reach those furthest behind first. Goal 17 explicitly calls for multi-stakeholder partnerships that mobilize and share knowledge, expertise, technology and resources, as well as better timely and reliable data.

Those ideas fit naturally with a network of local capability and global collaboration.

But fit is not proof.

A white paper should not display seventeen goal icons and imply that every Work advances every Goal. Relevance depends on the application, baseline and actual result.

HSIMC therefore proposes three levels of SDG connection:

- **Direct initial relevance** - the collaboration model itself can reasonably generate evidence related to this Goal.
- **Application-dependent relevance** - the Goal becomes relevant only when a particular Work creates the corresponding outcome.
- **Conditional / guardrail relevance** - the Goal mainly identifies an effect that must be checked or a future application area, not a current positive claim.

The following matrix is a starting point for measurement, not a certification.

SDG	Relevance to HSIMC approach	Example contribution path	Evidence needed before a positive claim
1 No Poverty	Conditional	paid micro-work, access to productive capability, resilient local income	net income change, participant baseline, persistence, displacement effects
2 Zero Hunger	Application-dependent	farm logistics, local food processing, reduced handling loss	food quantity/quality, loss baseline, farmer/work income, energy/material effects
3 Good Health and Well-being	Application-dependent	assistive mobility, reduced physical strain, safer handling	user outcome, safety evidence, adverse events, accessibility data
4 Quality Education	Direct initial relevance	learning by producing a reproducible function; technical/vocational skill formation	pre/post capability, independent task completion, participation and access
5 Gender Equality	Cross-cutting guardrail	reduce barriers to participation; recognize unpaid/care constraints; equal decision roles	participation, pay, leadership, workload, access data disaggregated appropriately
6 Clean Water and Sanitation	Conditional	water-process monitoring or lower-impact local processing	water use, discharge, contamination and treatment data
7 Affordable and Clean Energy	Application-dependent	energy-aware local production, shared equipment, lower-energy process	measured energy, baseline service equivalent, equipment life and rebound effects
8 Decent Work and Economic Growth	Direct initial relevance	paid local capability, safer work, SME participation, new productive roles	pay, hours, safety, job quality, external revenue, worker outcome
9 Industry, Innovation and Infrastructure	Direct initial relevance	connect small makers and existing equipment to digital/AI engineering	number of capable SMEs, accepted functions, infrastructure use, replication evidence
10 Reduced Inequalities	Direct initial relevance	lower entry barriers by language, hardware, geography, disability or firm size	who participates, who is excluded, affordability, accessibility, benefit distribution
11 Sustainable Cities and Communities	Application-dependent	accessible mobility, local repair/making, better use of shared urban assets	service access, congestion, safety, material and operating outcomes
12 Responsible Consumption and Production	Direct initial relevance	reuse, repair, traceable materials, less unnecessary replacement, verified production	material flow, scrap, added components, life extension, end-of-life and quality evidence
13 Climate Action	Application-dependent	measured energy/material interventions and climate-related capability building	GHG method, baseline, boundary, uncertainty, separate inventory/project reporting
14 Life Below Water			

SDG	Relevance to HSIMC approach	Example contribution path	Evidence needed before a positive claim
	Conditional / guardrail	prevent leakage or harmful waste from materials/processes	discharge, waste route, chemical/ material evidence relevant to aquatic impact
15 Life on Land	Conditional / guardrail	responsible material sourcing, reuse, land/agriculture applications	source traceability, land/ecosystem baseline, waste or restoration outcome
16 Peace, Justice and Strong Institutions	Direct governance relevance	transparent Authority, evidence, grievance and accountable decision records	access rules, consent, dispute handling, auditability, participation evidence
17 Partnerships for the Goals	Direct initial relevance	multi-stakeholder sharing of knowledge, expertise, technology and Resources	actual commitments, Work completed, contribution records, reliable data and replication

The strongest initial cluster

For the present white paper, the most defensible initial cluster is:

SDG 4, 8, 9, 10, 12 and 17.

Why?

Because the proposed system directly concerns:

- skills that let people perform useful technical work;
- productive and potentially paid participation;
- inclusive industry and innovation using existing infrastructure;
- reducing entry barriers between large and small participants;
- reuse, repair and responsible production decisions;
- multi-stakeholder partnership and shared technical capability.

Even here, the project still needs evidence. A training session is not automatically a decent job. A reused material is not automatically environmentally better. A small business connected to a platform is not automatically earning more. A partnership logo is not an implemented partnership.

The SDG mapping therefore asks for results rather than affiliation.

Application-dependent Goals should stay application-dependent

The mobility and baggage branches may create evidence relevant to SDG 3 or 11. Farm applications may create evidence relevant to SDG 2, 6, 13 or 15. Energy measurement may connect to SDG 7. Material leakage or waste handling may create a guardrail relevant to SDG 14.

The correct approach is to activate the relevant measurement when the Work enters that domain.

That avoids a common reporting problem: using a broad platform vision to claim outcomes that only a future project might create.

15.2 ESG is an operating lens, not a replacement for the SDGs

The SDGs describe public development outcomes. ESG is used in this white paper as a practical management lens for the environmental, social and governance effects of a Work.

The two can support each other, but they are not interchangeable.

Environmental: what physical burden changed?

For each material or physical Work, ask:

- What material entered?
- What new material was added?
- What scrap or failed sample was created?
- What energy was used?
- What transport or repositioning was required?
- Was an existing asset repaired, reused or kept in service longer?
- What happens at end of use?
- Did the intervention shift burden to another site, material or energy source?

Where GHG claims matter, state whether the number is:

- an organization inventory quantity;
- a product life-cycle inventory;
- a project/intervention estimate versus a counterfactual baseline;
- or an avoided-emissions estimate disclosed separately.

This is more credible than using a generic "green" label.

Social: who gains capability, income, access or dignity?

Ask:

- Who can participate who could not participate before?
- What skill was gained?
- Can the person complete a task independently?
- Is the contribution paid?
- How long does payment take?
- Does the new process reduce physical burden?
- Does it increase surveillance or pressure?
- Does it remove an income source without an alternative?

- Can people with different languages, devices or abilities use the service?
- Can a participant refuse or withdraw without losing unrelated access?

The social ledger should include negative outcomes and complaints, not only successful stories.

Governance: who decides, who can inspect, who can correct?

Ask:

- Who owns or controls the Resource?
- Who can read the relevant data?
- Who can authorize a physical action?
- Who can stop it?
- Who accepts the result?
- Who can dispute a payment or quality result?
- Can the evidence be reconstructed later?
- Are temporary credentials separated from permanent operation identity?
- Are participant roles and conflicts of interest visible?
- Is a failed or unsafe outcome preserved rather than erased from the story?

This governance layer connects directly to Part III: **Human Authority is a real-world decision relationship; protocol authorization is only one technical mechanism that helps enforce it.**

15.3 No One Left Behind becomes measurable when distribution is visible

The United Nations' Leave No One Behind guidance emphasizes identifying who is excluded and why, meaningful participation, evidence, transparency, privacy and accountability.

That means an HSIMC project should not report only the average result.

If ten firms benefit but the smallest firms cannot afford the required reader, the distribution matters.

If an airport service becomes faster for most passengers but harder for a traveler without a smartphone, the distribution matters.

If a local maker gains orders but must absorb unpaid sampling and rework, the distribution matters.

If an automation reduces heavy lifting but also removes a worker's paid hours, the distribution matters.

A practical LNOB review can ask:

1. **Who was expected to benefit?**

2. **Who actually participated?**
3. **Who could not participate, and why?**
4. **Who received cash or paid work?**
5. **Who contributed unpaid time or equipment?**
6. **Who gained decision power?**
7. **Who carried new risk, monitoring or compliance burden?**
8. **What alternative access path existed for people without the preferred device, language, account or skill?**
9. **Were complaints and failures recorded?**
10. **What changed in the next version because of that evidence?**

Relevance is not achievement

The most important reporting rule in this chapter is simple:

> **SDG relevance is not SDG achievement. ESG intention is not ESG performance. Evidence of one Work is not evidence for the whole platform.**

A credible public case should therefore label the evidence stage.

For value outcomes, a useful sequence is:

Proposed → Baseline measured → Work accepted → Outcome observed → Comparative result → Independently reproduced

This value sequence complements the engineering sequence from Part IV:

Documented → Simulated → Remote simulated → Physical reference → Physical delivered → Operational

Together, the two sequences prevent a common failure of technology storytelling: an idea, a prototype, a deployment and a sustained outcome are all presented as if they were the same thing.

A contribution statement template

A public statement can be short and still be rigorous:

> **Work:** [what was done]
> **Participants:** [who contributed / who accepted]
> **Baseline:** [what happened before]
> **Observed result:** [measured change]
> **Cash effect:** [realized / forecast / none demonstrated]
> **Capacity effect:** [minutes, throughput, access, etc.]
> **Environmental effect:** [measured flow and method]
> **Social effect:** [who benefited / who carried burden]
> **Governance evidence:** [Authority, custody, acceptance, dispute]
> **SDG relevance:** [specific Goals and why]
> **Limits:** [what this case does not prove]

This format is deliberately modest. It does not need a complicated rating to make the result useful.

The value of partnership is an executed interface

Goal 17 is especially important to this white paper because it explicitly recognizes multi-stakeholder partnerships that mobilize knowledge, expertise, technology and resources.

For HSIMC, however, the strongest evidence of partnership is not the number of organizations shown on a slide.

It is:

- one partner contributes a real capability;
- another contributes a real demand;
- Authority is clear;
- a Work is accepted;
- interfaces are understood;
- the Work is completed;
- value and burden are measured;
- another team can reproduce or improve it.

That is the point where partnership becomes infrastructure.

The invitation after Part V

The global invitation can now be stated with a stronger meaning:

> **Bring your existing capability.**
> **Deliver one reproducible function.**
> **Measure one useful outcome.**
> **Make GenAI plans become real value - now, here, globally.**

The next Part asks how this method can become an open network rather than a collection of isolated pilots: how technology ecosystems, local makers, institutions and future partners can join without losing local Authority, how reference results can mature into shared standards, and how a person or organization can begin with one specific contribution.

Source notes for Part V

The following sources support the external factual context used in this Part. HSIMC application journeys and accounting structures are proposals unless explicitly described as observed or externally deployed.

1. **United Nations, Transforming our world: the 2030 Agenda for Sustainable Development.** Source for the 17 SDGs, the integrated and indivisible framing, the pledge that no one will be left behind, and Goal 17 partnership/data language. https://sdgs.un.org/2030agenda
2. **United Nations Sustainable Development Group, Leave No One Behind.** Source for meaningful participation, evidence, data, transparency, privacy and accountability in LNOB implementation. https://unsdg.un.org/2030-agenda/universal-values/leave-no-one-behind
3. **GHG Protocol, Product Standard.** Source for product life-cycle accounting across raw materials, manufacturing, transportation, storage, use and disposal. https://ghgprotocol.org/product-standard
4. **GHG Protocol, Inventory and Project Accounting: A Comparative Review.** Source for the distinction between organization inventory accounting and project/intervention accounting, including separate treatment of avoided-emissions analysis. https://ghgprotocol.org/blog/inventory-and-project-accounting
5. **GHG Protocol, Estimating and Reporting Avoided Emissions.** Source for neutral disclosure of positive and negative comparative GHG impacts and the difficulty of credible avoided-emissions claims. https://ghgprotocol.org/estimating-and-reporting-avoided-emissions
6. **IATA, 2026 Global Passenger Survey.** Source for the reported 49% global use of AI for travel planning and survey scope of more than 10,000 responses from over 200 countries. https://www.iata.org/en/pressroom/2026-releases/10-28-iata-2026-global-passenger-survey-travelers-biometrics-ai-entry-requirements/
7. **Hong Kong International Airport, Baggage Pick-up and Delivery.** Source for current paid airport-to-hotel/home/downtown baggage delivery services by listed providers. https://www.hongkongairport.com/en/passenger-guide/airport-facilities-services/baggage-pick-up-and-delivery

8. **Hong Kong International Airport, MyTAG / MyTAG Support / MyTAG Privacy Policy.** Sources for RFID baggage-arrival notification, QR registration/linking and the data associated with the service. https://www.hongkongairport.com/iwov-resources/html/MyTag/en/mytagseries.html
9. **Hong Kong International Airport, About Us.** Source for HKIA's description of real-time trolley monitoring/tracking and other smart-airport capabilities. https://www.hongkongairport.com/en/about-us/?section=our-history

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End of Part V
Next: Part VI - The Invitation: A Global Network of Existing Capabilities