Regenerative Facility Management:

From Maintaining Facilities to Strengthening the Systems That Sustain Organizational Performance

An Integrated Framework for People, Workplace, Community, and Environment

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Author's Note

Facility Management has traditionally been judged by whether buildings work: whether assets remain available, services meet agreed standards, people remain safe, costs are controlled, and disruption is minimised.

Those responsibilities remain fundamental. They are not becoming less important.

The question addressed in this paper is whether they are sufficient.

A workplace does not operate independently from the human, social, and natural systems around it. People arrive at work carrying the effects of skills, health, family circumstances, mobility, community conditions, and previous experiences. Buildings depend on energy, water, materials, technology, supply chains, and ecological systems. Organisations depend upon communities for labour, suppliers, legitimacy, and resilience. Communities in turn are affected by the quality of employment, procurement, environmental practices, and investment generated by the organisations operating within them.

Facility Management sits at an unusual intersection of these relationships.

It touches people and buildings every day. It influences energy and resource use. It determines much of the lived workplace experience. It manages physical risks, asset reliability, security, hygiene, and operational continuity. It works through extensive supply chains and large frontline workforces. In many sectors, it is one of the organisational functions most consistently connected to the physical conditions in which strategy must actually be executed.

The proposition developed in this paper is straightforward, although its implications are substantial:

The future contribution of Facility Management should not be defined only by how efficiently it maintains facilities, but also by whether the systems upon which organisational performance depends become stronger through the way those facilities are managed.

This is the starting point for **Regenerative Facility Management (FM)**.

The concept developed from practitioner work examining the relationship between workplace performance, workforce capability, community development, environmental stewardship, resilience, and anticipatory risk management. The existing Regenerative FM framework defines four interconnected systems—*People*, *Workplace*, *Community,* and *Environment*—and argues that long-term performance cannot be achieved reliably by optimising them independently.

The present white paper takes that practitioner proposition considerably further. It examines its theoretical foundations, tests its assumptions against established and contemporary research, distinguishes what is already supported by evidence from what remains a proposition, and develops an operating and measurement architecture capable of being challenged, refined, and eventually validated empirically.

This paper should not be read as a claim that “Regenerative Facility Management” is already an established academic discipline.

It is a proposed extension of Facility Management practice built upon established bodies of knowledge in Facility Management, systems theory, regenerative development, organisational resilience,

stakeholder theory, workplace research, human capability, social value, and environmental sustainability.

Its purpose is to make that proposition sufficiently explicit that it can be debated and tested.

Executive Summary

Facility Management is changing because the system around it is changing.

The traditional FM mandate remains essential: maintain assets, provide safe and functional environments, meet service levels, manage risk, and support the core business. ISO 41001 similarly situates Facility Management within the objectives of the demand organisation and emphasises effective and efficient delivery, interested-party requirements, and sustainability (International Organization for Standardization [ISO], 2018). IFMA's formulation of the profession further recognises the integration of people, place, and process in support of quality of life and core-business productivity.

Yet organisations now operate amid pressures that are increasingly difficult to manage as separate variables. Climate risk interacts with energy security. Digitalisation changes assets and skills simultaneously. Workforce expectations interact with labour availability, wellbeing, and productivity. Supply-chain disruption creates operational, financial, and social consequences. Environmental performance increasingly affects regulatory exposure, capital allocation, and stakeholder expectations. Community conditions can influence recruitment, retention, supplier resilience, and organisational legitimacy.

The built environment itself remains material to the climate challenge. The United Nations Environment Programme reports that buildings and construction accounted for approximately 32% of global energy demand and 34% of energy- and process-related carbon dioxide emissions in 2024/2025. The IPCC's Sixth Assessment synthesis likewise makes clear that climate mitigation and adaptation must increasingly be considered together as part of climate-resilient development rather than as disconnected interventions (Intergovernmental Panel on Climate Change [IPCC], 2023; United Nations Environment Programme [UNEP], 2025).

These pressures have one characteristic in common: *they are systemic*.

A decision taken within one organisational function can produce consequences elsewhere. A reduction in labour expenditure can lower immediate contract cost while increasing turnover, skills loss, and operational instability. Deferred maintenance can improve a short-period budget while increasing asset deterioration, energy inefficiency, and disruption exposure. Technology can improve visibility while creating new capability dependencies. Environmental interventions can reduce resource use while requiring new workforce competencies. Local employment can strengthen community value while also reducing recruitment friction and increasing workforce stability.

The strategic issue is not simply that organisations face more pressures. It is that the relationships between those pressures increasingly determine performance.

Systems theory has long cautioned against understanding performance exclusively by decomposing a system into its individual components. General systems theory emphasised relationships and interdependence across system elements (von Bertalanffy, 1968). Meadows (2008) subsequently demonstrated how feedback, delays, accumulations, and system structure can create outcomes that are not obvious from examining individual components. Social–ecological resilience research similarly emphasises non-linearity, uncertainty, thresholds, adaptation, and interactions across scales (Folke, 2006).

Applied to Facility Management, this produces an important conclusion:

Optimising individual FM services does not necessarily optimise the workplace system.

Regenerative Facility Management is proposed as a response to that gap.

The current OCS framework defines Regenerative FM as an integrated and anticipatory approach intended to create long-term value by strengthening the capability of People, the performance of Workplaces, the social circularity of Communities. and the sustainability of the Natural Environment as interconnected elements, while increasing organisational resilience, adaptability, and future readiness.

This white paper develops that proposition into a more precise definition:

Regenerative Facility Management is an integrated and anticipatory approach to managing workplace ecosystems that seeks not only to maintain operational performance or reduce negative impacts, but continuously to strengthen the human, physical, social, and natural systems on which long-term organisational performance depends.

The distinction between conventional, sustainable, and regenerative approaches is important.

Traditional FM principally asks:

How can the organisation maintain safe, reliable, and efficient facilities?

Sustainable FM expands the question:

How can those facilities operate while reducing resource consumption, emissions, and other negative impacts?

Regenerative FM adds a further question:

How can the way a workplace is operated increase the future capability and resilience of the systems upon which its performance depends?

This does not make sustainability obsolete.

On the contrary, environmental sustainability, operational efficiency, compliance, and asset reliability are prerequisites. Regeneration without sound operational performance would have little practical value. The distinction lies primarily in direction and system boundary. Sustainable practice typically seeks to reduce harm, conserve resources, and improve environmental and social performance. Regenerative practice asks whether activities can additionally increase system capacity over time.

This extension has precedents outside FM. Reed (2007) argued for movement beyond efficiency-oriented sustainability toward participation in the health of living systems. Cole (2012) distinguished regenerative development from conventional green-building approaches by emphasising co-evolutionary relationships between human and natural systems. Regenerative development subsequently evolved into an explicit whole-systems methodology concerned with the capacity of living systems rather than individual interventions alone (Mang, P., Haggard, B., & Regenesis, 2016).

Regenerative FM applies a related logic to the operational phase of workplaces.

Its proposed architecture consists of four interconnected systems.

People concern capability, safety, health, wellbeing, dignity, inclusion, leadership, skills, and the conditions that enable workers to adapt and perform.

Workplace concerns the physical and operational environment: assets, engineering, safety, security, workplace experience, technology, reliability, indoor environmental quality, and continuity.

Community concerns the social ecosystem from which workplaces draw people, suppliers, knowledge, legitimacy, and partnerships, and to which they can contribute through employment, skills, procurement, and economic participation.

Environment concerns energy, carbon, water, materials, waste, circularity, climate resilience, pollution, biodiversity, and the natural systems upon which economic activity ultimately depends.

These categories are not intended as four independent pillars. Their value lies in the relationships between them.

A more capable technician can improve maintenance quality. Better maintenance can improve equipment efficiency and reliability. Greater reliability can reduce operational disruption. Lower energy waste can improve environmental and financial performance. Stable employment and credible career pathways can strengthen retention and local social mobility. Stronger local supplier capability can reduce supply-chain fragility. Better indoor environmental conditions can affect health, comfort, cognition, and workplace experience, although contemporary literature also demonstrates that these relationships are context-dependent and should not be overstated (Wang et al., 2021).

This is the mechanism through which regenerative value is proposed to emerge: not from four categories operating separately, but *through reinforcing relationships between them*.

The concept differs from an ESG scorecard.

ESG typically provides a framework through which environmental, social, and governance matters can be evaluated, governed, or disclosed. Regenerative FM is proposed as an operating model. Its concern is how day-to-day workplace decisions, services, investments, and relationships influence the future capacity of an interconnected operating system.

It also differs from Corporate Social Responsibility.

The Community element, for example, is not included because organisations should simply “give back.” It is included because social systems can be operationally material. Labour markets, vocational institutions, local suppliers, transport, housing, community trust, and economic opportunity can influence the availability, and stability of the workforce and supply chains upon which workplaces rely.

Stakeholder theory provides a foundational basis for moving beyond a narrow firm boundary when examining organisational value creation (Freeman, 1984). Porter and Kramer (2011) later advanced the related proposition that business competitiveness and social conditions need not be treated as inherently separate domains. Regenerative FM adopts neither framework uncritically but builds upon their central recognition that enterprise outcomes can depend upon relationships beyond the organisation's formal perimeter.

Indonesia provides a particularly relevant setting in which to examine the proposition.

The country's development trajectory combines industrialisation, urbanisation, digitalisation, climate exposure, a large and geographically diverse labour market, continued infrastructure expansion, and ambitious longer-term development objectives. At the same time, the green transition will require substantial changes in workforce capability. The World Bank's Indonesia Country Climate and Development Report explicitly frames climate action and economic development as interdependent rather than competing agendas. The OECD has similarly identified skills, vocational capability, digitalisation, and green-transition readiness as important issues for Indonesia's longer-term productivity and development (OECD, 2024; World Bank, 2023).

Indonesia's own policy work reinforces the workforce dimension. Bappenas has identified limited human-capital capability and policy coordination as constraints on the development of green jobs, while its Green Workforce Development Roadmap seeks to translate the transition toward a low-carbon economy into specific trainable competencies (Mariska, 2024; Ministry of National Development Planning/Bappenas, 2025).

For Facility Management, this creates both responsibility and opportunity.

FM is one of the sectors through which green skills can become embedded in everyday economic activity: energy management, building optimisation, engineering maintenance, waste management, water stewardship, indoor environmental quality, digital operations, workplace safety, circular practices, and asset lifecycle management are all ultimately dependent upon human capability.

The result is a model in which workforce development and environmental performance should not automatically be treated as competing expenditures. In many cases, workforce capability is the mechanism through which environmental performance is delivered.

The same reasoning applies to technology.

Digital twins, connected building systems, predictive analytics, and fault detection increasingly expand the visibility available to building operators. Contemporary reviews demonstrate their potential in asset information management and building fault detection (Drobnyi et al., 2023).

But technology cannot substitute for organisational integration.

A fragmented organisation with more sophisticated data may simply produce better visibility of fragmentation. Regenerative FM treats technology as enabling infrastructure connecting people, assets, information, and decisions—not as regeneration itself.

Organisational resilience provides another important foundation.

Duchek's (2020) capability-based model treats resilience not merely as post-crisis recovery but through capabilities involving anticipation, coping, and adaptation. Regenerative FM extends a compatible logic into workplace operations: *the purpose is not simply to recover from disruption, but continually to improve the conditions that increase the organisation's ability to encounter future pressure*.

This distinction becomes especially important for risk.

Conventional risk management often begins with identifiable hazards. A regenerative perspective additionally asks what system characteristics create exposure in the first place.

Is there sufficient technical capability?

Is critical knowledge concentrated in too few people?

Is preventive maintenance being sacrificed to short-term cost targets?

Is the workforce stable?

Are suppliers financially and operationally resilient?

Is energy dependency understood?

Are local communities able to supply future skills?

Can frontline information reach decision-makers quickly?

Are ecological constraints becoming operating constraints?

Risk, in this interpretation, is not managed only through controls. Some risks can also be reduced by strengthening the underlying system.

The white paper proposes three levels of measurement.

The first is *operational performance*: SLA achievement, safety, quality, response time, asset availability, cost, and compliance.

The second is *system outcomes*: capability, retention, workplace experience, supplier resilience, local employment, energy performance, emissions, water, waste, and related indicators.

The third is *regenerative capacity*: whether the underlying system is becoming more capable over time.

That third level is the most difficult, and the most important research challenge.

The existing **Regenerative Workplace Readiness Index™** provides a practitioner framework for assessing maturity across People, Workplace, Community, and Environment and positions organisations along a continuum from basic through reactive, managed, and integrated workplaces toward a regenerative workplace.

However, this paper makes an explicit methodological qualification:

The RWRI should presently be understood as a conceptual and practitioner assessment framework, not as a scientifically validated psychometric or predictive instrument.

Empirical validation would require construct specification, scoring logic, reliability testing, criterion validity, longitudinal data, and testing across organisations, sectors, and geographies.

This distinction is important because the purpose of the white paper is not to make the framework appear more established than the evidence permits.

The same discipline applies to Regenerative FM itself.

Some propositions in this paper are strongly grounded in established literature: interconnected systems matter; workplace conditions can influence people; workforce capability affects organisational performance; climate and resource risks affect the built environment; organisational resilience involves anticipatory and adaptive capacities; and stakeholder relationships influence enterprise outcomes.

Other propositions remain to be tested empirically.

For example:

Does greater integration across People, Workplace, Community and Environment predict stronger organisational resilience?

Does community integration measurably improve workforce stability?

Can regenerative maturity predict disruption performance?

What proportion of social or environmental outcomes can legitimately be attributed to FM?

Does an improvement in one system generate measurable reinforcement in others?

Those questions form part of the research agenda developed later in the paper.

Regenerative Facility Management should be understood neither as a finished theory nor as a marketing synonym for sustainable FM.

It is a proposition about the future operating logic of the profession:

Facility Management can create greater long-term value when it manages not only services and assets, but the relationships among the human, physical, social, and natural systems that allow organisations to perform.

PART I

THE PROBLEM

1. The Changing Role of Facility Management

1.1 From a building function to organisational infrastructure

Facility Management emerged from a practical necessity: organisations require physical environments in which people, equipment, and processes can operate reliably.

For much of its history, the profession's value proposition could be expressed through tangible operational outcomes: functioning buildings, available assets, safe environments, efficient services, and controlled operating cost.

None of these objectives has disappeared.

What has changed is the complexity of the operating environment in which they must now be achieved.

IFMA, drawing on the ISO definition, describes Facility Management as an organisational function integrating people, place, and process within the built environment to improve people's quality of life and the productivity of the core business. ISO 41001 goes further by explicitly connecting the FM management system to the objectives of the demand organisation and the requirements of interested parties (ISO, 2018).

This matters because it places FM conceptually closer to organisational performance than to buildings alone.

If the purpose of FM were only to preserve physical assets, building maintenance would largely define its boundaries. But contemporary FM already encompasses engineering, cleaning, security, workplace experience, energy, sustainability, technology, space, risk, service integration, human experience, and increasingly data-driven decision-making.

In practice, Facility Management has gradually moved along a continuum:

maintenance → services → integrated FM → workplace management → strategic organisational capability.

The next stage is unlikely to be another layer of service bundling.

The more consequential development is a change in the unit of analysis.

Traditional FM tends to treat the facility as the primary object being managed.

Regenerative FM proposes that the relevant unit is the workplace ecosystem.

The difference is substantial.

A facility has boundaries.

An ecosystem has relationships.

1.2 The facility is no longer an isolated operating object

Consider an industrial facility.

Its operational reliability may appear primarily to depend on equipment, engineering, and maintenance. Yet those factors themselves depend upon the availability of competent technicians, spare parts, supplier capability, energy, water, digital infrastructure, management systems, environmental conditions, and timely decision-making.

A workforce shortage becomes an asset risk.

A supplier failure becomes an uptime risk.

Heat becomes a health and productivity risk.

Poor community relations can become a recruitment or legitimacy risk.

Skills shortages become a technology-adoption risk.

Energy volatility becomes a cost and continuity risk.

Climate events become facility-access, logistics, safety, and business-continuity risks.

The facility has not changed physically.

The understanding of what determines its performance has changed.

The same applies to an office, hospital, data centre, logistics facility, educational campus, or bank.

Operational outcomes emerge from multiple interacting systems.

This is precisely the type of problem for which systems thinking becomes useful.

2. Why Fragmented Optimisation Becomes a Strategic Risk

2.1 The organisational logic of fragmentation

Specialisation is one of the principal mechanisms through which modern organisations manage complexity.

Engineering specialists manage assets.

HR manages workforce policy.

Finance controls expenditure.

Procurement manages suppliers.

IT manages information systems.

Sustainability teams manage environmental commitments.

Corporate affairs may manage communities.

Risk functions manage enterprise exposure.

Facility Management coordinates the physical operating environment.

Each function has legitimate expertise.

The difficulty emerges when each is managed primarily against its own scorecard.

A system can contain individually well-managed functions and still underperform collectively.

This is not necessarily a failure of people.

It can be a *failure of architecture*.

Von Bertalanffy's general systems theory challenged reductionist explanations that assume system behaviour can always be understood by decomposing a whole into independent parts (von Bertalanffy, 1968). Meadows (2008) similarly showed that system outcomes frequently arise from relationships, feedback structures, accumulations, and delays rather than from single variables.

In organisational practice, this means an intervention can be locally rational and systemically damaging.

2.2 When savings are not savings

Consider a simplified FM labour decision.

A procurement exercise reduces labour cost by 8%.

The direct financial saving is visible immediately.

But suppose the new commercial model also reduces supervisory capacity, training investment, and wage competitiveness.

Turnover rises.

Experienced workers leave.

Recruitment increases.

New employees require training.

Service consistency declines.

Supervisors spend more time managing vacancies.

Customer complaints rise.

Safety exposure increases.

Managers introduce additional controls.

Productivity falls.

The original 8% saving remains visible in one budget line.

The transferred costs appear elsewhere.

This is an example of cost displacement.

The same pattern can occur with asset maintenance.

A maintenance budget reduction improves annual operating expenditure. Preventive activity is deferred. Equipment condition deteriorates more rapidly. Energy consumption rises. Failures become more frequent. Eventually a major disruption requires reactive expenditure considerably greater than the original saving.

Again, the initial decision can be correct according to one measure and wrong according to the system.

Regenerative FM does not reject efficiency.

It rejects efficiency that is defined too narrowly.

2.3 The limits of the SLA as the primary definition of value

Service-level agreements remain essential.

They define expectations, responsibilities, and accountability.

But an SLA is necessarily selective. It measures the dimensions of performance that parties have chosen to specify.

That creates a measurement problem.

What happens when important value emerges outside the contract scorecard?

A cleaning operation may meet all output specifications while simultaneously developing a stable workforce, reducing chemicals, lowering water consumption, creating career pathways, and improving local employment.

A technical-maintenance contract may meet uptime requirements while also extending asset life, improving energy efficiency, and building scarce engineering capability.

Alternatively, a contract may meet headline SLAs while relying on high turnover, fragile supervision, poor supplier resilience, or excessive reactive maintenance.

The SLA can confirm whether contracted outputs were achieved.

It cannot always reveal whether the underlying operating system is becoming stronger or weaker.

The current Regenerative FM framework addresses this by proposing that value should be considered across workforce capability, workplace performance, community outcomes, and environmental performance rather than SLA compliance alone.

This white paper takes that reasoning further.

It proposes that the most important long-term FM question may not be:

Did the system meet today's target?

but:

Is the system becoming more capable of meeting tomorrow's target?

3. Why Sustainability Alone Does Not Resolve the System Problem

Sustainability has significantly expanded the responsibilities of the built environment.

Energy consumption, carbon emissions, water, waste, materials, and environmental performance have moved from peripheral technical concerns toward strategic issues.

This shift is necessary.

The built environment cannot be separated from global climate and resource challenges. UNEP's assessment of energy demand and emissions associated with buildings demonstrates the scale of the issue, while the IPCC stresses the importance of integrating mitigation, adaptation, and development pathways (IPCC, 2023; UNEP, 2025).

However, the term sustainability covers a wide range of practices.

Some primarily improve efficiency.

Some reduce environmental harm.

Some preserve resources.

Some strengthen social outcomes.

Some address adaptation or resilience.

Some seek transformation.

The distinction matters because the term can become so broad that almost any improvement is described as sustainable.

Regenerative Facility Management does not attempt to replace sustainability with a supposedly superior label.

It asks a narrower conceptual question:

What happens after harm reduction?

If a building uses less energy, that is beneficial.

If it produces less waste, that is beneficial.

If it emits less carbon, that is beneficial.

But if an organisation simultaneously depletes workforce capability, weakens suppliers, creates unstable employment, or operates in ways that increase future vulnerability, the whole system may still become less resilient.

Conversely, an environmentally responsible FM model that develops technical capability, improves asset performance, creates stronger local suppliers, and reduces resource dependency can potentially reinforce several systems simultaneously.

Regeneration introduces **the concept of capacity**, not merely impact.

Reed (2007) framed regenerative development partly as a movement beyond reducing damage toward participating in the health of living systems. Cole (2012) similarly differentiated regenerative approaches from conventional green-building thinking by emphasising the co-evolution of human and natural systems rather than environmental performance alone.

The application to Facility Management is not exact, and this paper does not claim otherwise.

Buildings are not ecosystems in a literal biological sense.

Organisations are not natural ecologies.

But workplaces can legitimately be understood as socio-technical systems embedded within wider social and ecological systems.

That provides the bridge.

PART II

INTELLECTUAL FOUNDATIONS

1. Systems Thinking: The First Foundation

The first theoretical foundation of Regenerative FM is **systems thinking**.

The importance of this foundation is difficult to overstate because without it the proposed model risks becoming merely a four-pillar sustainability framework.

The four categories—*People*, *Workplace*, *Community*, and *Environment*—are not in themselves the innovation.

The relationships among them are.

A system is more than a collection of components.

It contains interactions, dependencies, feedback, delays, and emergent behaviour.

This makes three principles particularly relevant to FM.

First, causality is often distributed.

An asset failure may be attributed to a component.

But the deeper causes can include procurement, maintenance strategy, staffing levels, knowledge, operating practices, data quality, and capital-allocation decisions.

Second, effects can be delayed.

Underinvestment in capability may not immediately affect performance.

The system can continue functioning because experienced employees compensate.

Only after attrition occurs does the capability deficit become visible.

Third, interventions can create feedback loops.

Better training can improve quality.

Improved quality can increase trust.

Greater trust can support stronger employee engagement.

Higher engagement can improve retention.

Better retention preserves organisational knowledge.

Preserved knowledge further improves performance.

The intervention produces effects beyond its original boundary.

The opposite is also possible.

Poor staffing conditions can increase turnover.

Turnover can reduce capability.

Reduced capability increases workload on experienced employees.

Workload increases burnout and further turnover.

A reinforcing negative loop develops.

Regenerative FM is concerned with identifying and intentionally influencing these loops.

2. Regenerative Development: The Second Foundation

Regeneration did not originate in Facility Management.

Its intellectual development is most visible in ecological design, architecture, planning, and regenerative development.

Reed (2007) criticised a narrow sustainability paradigm centred primarily on reducing environmental damage and argued for a whole-systems orientation concerned with the health of living systems. Cole's work subsequently examined regenerative design as an evolution from green-building approaches toward relationships that can increase social and natural capital (Cole, 2012; Reed, 2007).

The Regenesis Group later developed regenerative development as a methodology that considers people and human activity as participants in living systems rather than as external managers of them (Mang, P., Haggard, B., & Regenesis, 2016).

These ideas provide useful principles for Regenerative FM:

- whole-system perspective;
- relationship rather than isolated intervention;
- development of system capacity;
- place-specific context;
- long-term value rather than short-term optimisation;
- co-evolution rather than static end-state thinking.

However, Regenerative FM requires adaptation rather than transplantation of regenerative-development theory.

Facility Management operates under specific commercial, technical, and institutional conditions.

Buildings have service requirements.

Hospitals must maintain infection control.

Factories require production reliability.

Data centres require uptime.

Financial institutions require security.

Contracts have budgets.

Organisations have accountabilities.

Regenerative FM cannot abandon conventional performance logic.

It must integrate regeneration with operational discipline.

This leads to an important principle:

Operational excellence is not the alternative to regeneration. It is the platform from which regeneration becomes credible.

A facility that cannot maintain safety, compliance, reliability, or service quality cannot reasonably describe itself as regenerative.

3. Resilience: The Third Foundation

Resilience has become increasingly important in organisational and environmental scholarship.

The concept is frequently reduced in management language to "*bouncing back*."

That definition is too narrow for the purpose of Regenerative FM.

Social–ecological literature emphasises adaptation, non-linearity, uncertainty, and changing system states rather than simple restoration of equilibrium (Folke, 2006). Organisational research similarly increasingly treats resilience as a dynamic capability rather than a post-event response.

Duchek (2020), for example, conceptualises organisational resilience through capabilities associated with anticipation, coping, and adaptation.

This framing is highly relevant to FM.

A purely reactive workplace manages failure after it occurs.

A preventive workplace reduces the probability of known failures.

A predictive workplace uses condition and data to identify emerging failures.

An adaptive workplace changes in response to new conditions.

An anticipatory workplace considers plausible future conditions and develops capability before they become immediate operational problems.

A regenerative workplace adds another dimension:

it attempts to increase the capacity of the system itself.

This is the bridge between resilience and regeneration.

Resilience asks:

Can the system continue or recover under pressure?

Regenerative FM asks:

Are everyday operations making the system more capable of encountering future pressure?

The distinction is subtle but important.

4. Stakeholder Theory and Shared Value: The Fourth Foundation

A workplace has legal boundaries.

Its consequences do not.

Employees, contractors, communities, suppliers, customers, regulators, and environmental systems may all be affected by operational decisions.

This does not mean an organisation can—or should—assume responsibility for every external condition.

It means the organisational boundary and the value-creation boundary are not always identical.

Freeman's stakeholder approach challenged a model of strategy concerned primarily with shareholders by emphasising relationships among groups upon whom organisational success depends (Freeman, 1984).

Porter and Kramer (2011) later argued that corporate competitiveness and social conditions can intersect through shared-value strategies.

Regenerative FM draws a narrower operational inference:

A community should matter to FM not merely because community engagement is socially desirable, but because workforce availability, skills, suppliers, transport, social stability, and stakeholder trust can all influence operational outcomes.

The same relationship works in the opposite direction.

FM organisations can be significant local employers.

They purchase goods and services.

They train frontline workers.

They manage waste and water.

They affect public-facing environments.

They influence occupational standards.

They can create pathways into formal employment.

This means FM has both dependencies upon and effects upon communities.

That two-directional relationship is why Community belongs within the operating system rather than outside it as philanthropy.

5. Human Capability: The Fifth Foundation

Buildings perform through people.

Even highly automated environments depend upon human judgement, maintenance, escalation, interpretation, governance, and intervention.

Human capability constitutes infrastructure.

Traditional accounting does not normally treat workforce capability as an asset in the same way it treats equipment.

Operationally, the absence of capability can render equipment ineffective.

A sophisticated BMS without capable operators produces data but not necessarily better decisions.

A digital twin without reliable information governance can reproduce inaccurate assumptions.

Predictive maintenance without technicians able to diagnose and act upon findings does not become preventive action.

Technology changes the capability requirement; it does not eliminate it.

The social dimension is equally important.

Edmondson's (1999) research on psychological safety demonstrated the relationship between team conditions and learning behaviour. Contemporary research continues to show that wellbeing and productivity interact in more complex ways than simplistic “happy worker” assumptions imply (Edmondson, 1999; Isham et al., 2021).

The Regenerative FM People system cannot be reduced to employee satisfaction.

It concerns the capacity of the workforce to:

- perform;
- learn;
- adapt;
- identify risk;
- use technology;
- retain knowledge;
- develop professionally;
- work safely;
- exercise judgement;
- and sustain performance over time.

That is why capability development is a regenerative variable.

PART III

DEFINING REGENERATIVE FACILITY MANAGEMENT

1. A Formal Definition

The practitioner framework underpinning this white paper originally defined Regenerative FM as:

an integrated and anticipatory approach to Facility Management that creates long-term value by proactively enhancing the capability of People, the performance of Workplaces, the social circularity of Communities, and the sustainability of the Natural Environment as interconnected elements, while strengthening organisational resilience, adaptability, and future readiness.

For the purposes of research and wider professional application, this white paper refines the definition to:

Regenerative Facility Management is an integrated and anticipatory approach to managing workplace ecosystems that seeks not only to maintain operational performance or reduce negative impacts, but continuously to strengthen the human, physical, social, and natural systems on which long-term organisational performance depends.

Each word is intentional.

- **Integrated**

  Regenerative FM does not treat workforce, assets, community, and environmental performance as independent programmes.

Integration means decisions are evaluated for their cross-system effects.

- **Anticipatory**

  The approach does not rely exclusively upon historical failures or current conditions.

  It seeks emerging risks, capability gaps, and future dependencies.

- **Workplace ecosystem**

  The object being managed is wider than the building.

  It includes the physical workplace and the human, technological, organisational, social, and ecological relationships required for it to function.

- **Continuously**

  Regeneration is not a project endpoint or certification event.

  It is a direction of system development.

- **Strengthen**

  The defining test is not whether activity exists, but whether relevant capacity improves.

  Human, physical, social, and natural systems

These correspond operationally to People, Workplace, Community, and Environment.

- **Long-term organisational performance**

  Regenerative FM remains connected to organisational purpose.

  It is not an alternative mission imposed upon the enterprise.

  Its legitimacy depends upon demonstrating that stronger underlying systems support durable organisational performance while generating wider human, social, and environmental value.

2. What Regenerative FM Is Not

Conceptual discipline is necessary because "regenerative" risks becoming another broad corporate adjective.

Regenerative FM is explicitly not:

- **ESG rebranding**.

  ESG can inform governance, disclosure, and investment considerations. Regenerative FM concerns the operating relationships that can produce some of those outcomes.

- **CSR.**

  Community is treated as an operating ecosystem, not merely a beneficiary of corporate generosity.

- **Sustainable FM with a different label.**

  Environmental harm reduction remains essential, but regenerative logic introduces system capacity and reinforcing relationships.

- **Technology-led FM.**

  Smart buildings, AI, sensors, and analytics are enabling infrastructure. Technology can make a workplace more intelligent without making it regenerative.

- **Employee wellbeing alone.**

  People are one system among four, and even within the People dimension the concern extends to capability, safety, skills, inclusion, dignity, and adaptability.

- **A replacement for operational excellence.**

  Safety, reliability, hygiene, compliance, asset performance, and service quality remain non-negotiable.

- **A claim that every FM intervention produces net-positive impact.**

  Trade-offs exist. Some environmental improvements require capital. Some workforce interventions increase near-term cost. Some system objectives conflict.

- **A scientifically validated theory.**

At this stage Regenerative FM is best described as a practitioner-derived conceptual framework grounded in established fields but requiring empirical validation of its distinct system-level propositions.

That final qualification is particularly important.

Credibility should come from the framework's ability to withstand scrutiny, not from avoiding it.

3. Traditional, Sustainable and Regenerative FM

Exhibit 1. Evolution of operating logic

Dimension	Traditional FM	Sustainable FM	Regenerative FM
Core question	Are facilities working?	Can impacts be reduced?	Is system capacity becoming stronger?
Primary objective	Reliability and efficiency	Reduced environmental/ social harm	Long-term capacity and resilience
Unit of analysis	Facility/service	Facility/lifecycle/impact	Workplace ecosystem
Time horizon	Operational/contract	Asset lifecycle	System and long-term capability
Risk orientation	Respond/control	Prevent/mitigate	Anticipate/adapt/strengthen
Workforce	Delivery resource	Stakeholder	Capability system
Community	External stakeholder	Social-impact consideration	Operating ecosystem
Environment	Compliance/resource input	Footprint/impact	Dependency, resilience, and stewardship
Technology	Automation/efficiency	Efficiency and reporting	Integration, sensing, and adaptation
Measurement	SLA/KPI	ESG/resource metrics	Operational + system + capacity metrics
Value concept	Cost/service	Efficiency and impact	Enterprise + social + environmental resilience

This comparison should not be interpreted as three mutually exclusive categories.

A regenerative approach contains conventional FM and sustainability capabilities within it.

The relationship can be expressed as:

Operational excellence → Sustainable performance → Integrated resilience → Regenerative capacity

Each level requires the one beneath it.

4. The Four-System Architecture

The present framework retains four operating systems:

- People
- Workplace
- Community
- Environment

The existing **Regenerative Value Engine™** positions these systems beneath organisational purpose and connects them through integrated operations, technology, and data, followed by an operating cycle of anticipating, preventing, optimising, and adapting.

The model is useful, but this white paper introduces a more rigorous interpretation.

The four systems should not be understood as four equal boxes.

They perform three different roles simultaneously.

First, they are domains of intervention.

Second, they are sources of organisational dependency.

Third, they are sources of feedback into the other systems.

This distinction will become central in the next part of the paper.

PART IV

THE FOUR-SYSTEM MODEL

1. System One: People

1.1 People as operating infrastructure

The first system is People.

This may appear self-evident. Facility Management is a service-intensive profession, and even increasingly automated workplaces remain dependent upon human judgement, intervention, supervision, and coordination.

Yet the conventional operating model often treats labour primarily as an input.

Headcount is planned.

Shifts are allocated.

Training is recorded.

Productivity is measured.

Absence and turnover are monitored.

The regenerative perspective asks a different question:

Is the workforce becoming more capable, more adaptable, and better able to sustain performance over time?

The distinction is significant.

A workforce can be fully staffed while losing capability.

It can meet today's service requirements while becoming progressively less resilient.

It can complete required training while failing to develop judgement.

It can deploy new technologies while becoming more dependent upon a small number of specialists.

Regenerative FM treats human capability not simply as an HR concern, but as an operating asset.

This does not mean that people should be reduced to economic instruments. The opposite is intended. Human dignity, wellbeing, safety, and opportunity matter in their own right. At the same time, organisations should recognise that the quality of employment conditions also affects system performance.

1.2 Capability rather than headcount

Headcount answers:

How many people are available?

Capability answers:

What can the system reliably do because those people are present?

That difference matters particularly in technical environments.

A maintenance team of ten people is not equivalent to another team of ten if one possesses deeper diagnostic capability, stronger digital competence, better safety discipline, and greater organisational knowledge.

This suggests that workforce capacity has at least six components:

1. technical competence;
2. operational knowledge;
3. judgement;
4. adaptive capability;
5. relational capability;
6. institutional memory.

These dimensions interact.

Technical knowledge without judgement can produce rigid decision-making.

Experience without updated skills can become obsolete.

Digital capability without engineering understanding can produce misplaced confidence in data.

Leadership without psychological safety can suppress weak signals from frontline operations.

A regenerative workforce architecture needs to develop not only individuals but the conditions through which capability can circulate.

1.3 Learning as an operational process

Learning is often separated from operations.

Training happens in classrooms.

Work happens elsewhere.

Regenerative FM requires the two to be connected.

The most valuable operational learning frequently occurs where work is actually performed:

- during failure analysis;
- through root-cause investigation;
- after near misses;
- when maintenance technicians identify recurring anomalies;
- when frontline colleagues see behaviour that senior managers cannot observe;
- when a customer complaint exposes a process weakness;
- or when a new technology changes how a service is delivered.

Edmondson's foundational work on psychological safety showed that teams are more likely to engage in learning behaviours when individuals believe interpersonal risk can be taken without punishment or humiliation (Edmondson, 1999).

For FM, this has a practical implication.

A workplace with excellent sensors but poor upward communication may be less intelligent than one with modest technology and a workforce able to escalate weak signals early.

The People system includes the flow of operational knowledge, not simply workforce competence.

1.4 Dignity and decent work

Regenerative FM also requires a stronger interpretation of frontline employment.

Many FM services depend heavily upon cleaners, security officers, technicians, reception teams, drivers, landscaping personnel, and other frontline colleagues.

These roles are often physically demanding.

Many are exposed to customer behaviour, environmental hazards, repetitive work, difficult schedules, or limited career mobility.

A regenerative operating model cannot plausibly claim to strengthen workplaces if the people who sustain those workplaces remain structurally excluded from development.

The minimum requirement is decent work.

The International Labour Organization's decent-work framework centres productive employment, rights at work, social protection, and social dialogue. Contemporary green-transition work from the ILO also emphasises that the shift toward more sustainable economies requires deliberate development of new competencies rather than assuming labour markets will adjust automatically.

For Regenerative FM, dignity has operational implications:

- fair and responsible employment;
- safe working conditions;
- access to learning;
- appropriate supervision;
- respectful treatment;
- career visibility;
- inclusion;
- mechanisms for voice;
- and pathways for advancement.

These should not be treated solely as social metrics.

They influence retention, capability, trust, and operational stability.

1.5 The frontline workforce as an intelligence network

Frontline employees occupy a strategically important position.

They see physical conditions repeatedly.

They observe deviations.

They interact with users.

They recognise when equipment sounds different, when waste patterns change, when access behaviour becomes unusual, when hygiene deteriorates, or when customer frustration increases.

This creates a distributed sensing capability.

In traditional hierarchies, much of this information is lost.

Reporting systems privilege events that have already been formally classified.

Regenerative FM should deliberately capture weak signals.

That requires:

- accessible reporting;
- supervisory attention;
- psychological safety;
- structured escalation;
- digital tools where appropriate;
- and feedback to employees showing that reported information has been considered.

A colleague who reports a pattern ten times but receives no response eventually stops reporting.

At that point, the system has lost a sensor.

1.6 Green skills and the FM workforce

The environmental transition creates a further capability challenge.

Decarbonisation cannot be implemented through policy documents alone.

Buildings must actually be operated differently.

Energy systems need tuning.

Equipment requires commissioning.

Metering must be understood.

Waste needs segregation and traceability.

Water use must be monitored.

Refrigerants require responsible management.

Asset decisions need lifecycle thinking.

Data must be interpreted.

These are workforce capabilities.

The ILO explicitly links green-economy transition with the need to anticipate and develop appropriate skills across sectors, including green building.

This has particular significance for FM because many “green jobs” will not be entirely new occupations.

Existing roles will become greener.

A technician may remain a technician while needing competence in energy analytics.

A procurement manager may need lifecycle and circularity knowledge.

A cleaner may need greater chemical and resource-management knowledge.

A supervisor may need to understand environmental-performance data.

The workforce transition is partly about greening existing work.

1.7 Inclusion as system resilience

Inclusion should also be understood systemically.

The usual case for inclusion is moral, social, and legal.

Those arguments remain sufficient in themselves.

But there is also a resilience dimension.

A workforce drawn from narrow demographic, educational, or social channels can create capability concentration and labour-market vulnerability.

Broader access to work can expand talent pools.

Inclusive vocational pathways can bring people into formal employment who may otherwise remain excluded.

Accessible workplace design can widen participation.

Diverse perspectives can improve problem identification.

However, this relationship should not be overstated.

Diversity does not automatically produce performance.

The organisational conditions through which difference can contribute matter.

Inclusion concerns not simply representation, but whether people can participate effectively in the system.

1.8 People-system indicators

A regenerative People scorecard should move beyond training hours and engagement scores.

Potential indicators include:

Level	Illustrative measures
Operational	staffing fulfilment, absenteeism, safety events, mandatory training completion
Capability	certification attainment, competency depth, multi-skilling, succession coverage
Stability	regrettable turnover, tenure distribution, vacancy duration, supervisory continuity
Learning	near-miss reporting, improvement suggestions, lessons closed, repeat-failure reduction
Mobility	internal promotion, career progression, vocational qualification
Inclusion	participation, accessibility, workforce diversity, pay or opportunity equity where measurable
Regenerative capacity	proportion of critical roles with future-ready competencies; capability trend over time

The key question is trajectory.

A workforce with today's required capability but deteriorating retention may appear strong on a static dashboard while becoming weaker.

Regenerative measurement needs both state and direction.

2. System Two: Workplace

2.1 The workplace remains the operational core

Regenerative FM should not become so conceptually broad that it loses the building.

The Workplace system remains the operational core.

It includes:

- physical assets;
- engineering systems;
- workplace experience;
- security;
- cleaning and hygiene;
- indoor environmental quality;
- space;
- digital infrastructure;
- energy systems;
- fire and life safety;
- maintenance;
- business continuity;
- and service integration.

The current Regenerative FM framework describes the Workplace system as responsible for safe, productive, and intelligent workplaces and explicitly connects engineering, digital tools, and workplace experience with continuous improvement.

The deeper question is how that workplace changes from being an object of maintenance to becoming an adaptive operational platform.

2.2 Reliability before regeneration

The first principle is simple:

A regenerative workplace must first be a reliable workplace.

There is little value in sophisticated sustainability claims if:

- critical equipment repeatedly fails;
- fire systems are non-compliant;
- indoor conditions are unsafe;
- cleaning standards are poor;
- security is weak;
- maintenance backlogs are uncontrolled;
- or engineering documentation cannot be trusted.

This establishes a hierarchy.

Regeneration cannot substitute for fundamentals.

The progression is:

safe → compliant → reliable → efficient → integrated → adaptive → regenerative.

Not every facility needs to operate at the final level immediately.

The model is a direction of maturity rather than a universal minimum threshold.

2.3 Asset reliability as a systems outcome

Traditional maintenance often focuses on equipment.

Regenerative maintenance focuses on the capability surrounding equipment.

A chiller does not maintain itself.

Its performance depends upon:

- design;
- commissioning;
- maintenance;
- operating settings;
- sensor quality;
- technician capability;
- spare-parts availability;
- energy strategy;
- budget decisions;

- and management attention.

Asset reliability is partly technical and partly organisational.

This is why recurring failure should not automatically be treated as a maintenance-team problem.

Failure can be produced by upstream decisions.

For example:

- a procurement decision can remove OEM support;
- a staffing decision can reduce preventive work;
- a financial target can defer replacement;
- an information-system weakness can obscure condition deterioration;
- a capability gap can prevent correct diagnosis.

Regenerative FM seeks the system behind the failure.

2.4 From reactive maintenance to anticipatory asset management

The maintenance continuum can be represented as:

Reactive → Preventive → Condition-based → Predictive → Prescriptive → Anticipatory.

Reactive maintenance responds after failure.

Preventive maintenance intervenes according to predetermined intervals.

Condition-based maintenance responds to observed asset condition.

Predictive maintenance uses data and patterns to anticipate likely failure.

Prescriptive approaches identify possible interventions.

Anticipatory asset management adds wider contextual factors:

- future operating conditions;
- supply-chain dependency;
- asset obsolescence;
- climate exposure;
- skills availability;
- energy transition;
- and business-criticality changes.

Digital twins and connected asset technologies can materially strengthen this capability. Reviews of digital-twin applications in building operations identify substantial potential for condition monitoring, predictive maintenance, information integration, and operational decision support, although implementation remains constrained by data quality, interoperability, and integration challenges (Zhang, Yang, & Wang, 2023).

That qualification matters.

Technology increases potential intelligence.

It does not guarantee intelligent operation.

2.5 Indoor environmental quality and human performance

The Workplace and People systems interact most visibly through indoor environmental quality.

Temperature, air quality, acoustics, lighting, spatial configuration, and perceived environmental quality can influence comfort, satisfaction, wellbeing, and aspects of performance (Dam-Krogh et al., 2024).

Contemporary evidence supports these relationships while also warning against simplistic claims.

A 2023 systematic review of 55 office studies found substantial evidence linking aspects of indoor climate, spatial conditions and naturalness with wellbeing, productivity, and satisfaction, while evidence for cognitive performance was less consistent (Zhang et al., 2023).

A 2025 systematic review and meta-analysis likewise found generally positive relationships between indoor environmental quality and productivity but exceedingly high heterogeneity across studies, indicating strong contextual effects, and potential publication bias (Braga et al., 2025).

This is precisely why Regenerative FM should avoid statements such as:

“better air quality increases productivity by X%”

unless a specific study and context justify the number.

A more defensible proposition is:

Workplace environmental conditions can materially affect occupants, but the magnitude and direction of effects depend on context, task, climate, perception, and measurement method.

This has an operational consequence.

FM should measure both:

- objective environmental conditions;
- and occupant experience.

Neither alone provides a complete picture.

2.6 Workplace experience as operational data

Workplace experience is sometimes treated as hospitality.

That interpretation is too narrow.

Experience can reveal system quality.

Complaints about temperature may indicate control problems.

Repeated navigation difficulties may reveal poor spatial design.

Queuing can indicate workflow mismatch.

Noise complaints may expose zoning failures.

Meeting-room frustration can reveal technology or booking-system problems.

Poor washroom experience can indicate cleaning design, consumables, traffic patterns, or maintenance weaknesses.

The human experience of a workplace is partly a diagnostic layer.

Post-occupancy evaluation has long attempted to compare intended building performance with actual user experience. A recent review confirms that such evaluation remains relevant, while noting substantial methodological variation across studies and inconsistent treatment of productivity outcomes.

Regenerative FM can build on that logic by treating user feedback as one component of continuous system sensing.

2.7 Digital technology: integration rather than decoration

Many smart-building programmes accumulate technology faster than they improve decision-making.

Sensors are installed.

Dashboards multiply.

Data volume increases.

But ownership of action remains unclear.

This creates a familiar problem: data-rich, decision-poor workplaces.

The value of technology depends on its place within an operating model.

A useful digital architecture should answer:

- What is being sensed?
- Why does it matter?
- Who owns the signal?
- What threshold triggers action?
- Who acts?
- How quickly?
- What evidence closes the loop?
- What is learned?

This is why the Regenerative Value Engine places technology and data beneath the four systems rather than above them. In the existing model, technology is an integrating capability rather than an end state.

A regenerative digital principle can be stated:

Digitising a fragmented process does not integrate it; it merely makes fragmentation faster and more visible.

2.8 Workplace-system indicators

Potential measures include:

Level	Illustrative measures
Operational	uptime, SLA performance, safety, work-order closure, cleaning quality
Asset	condition index, backlog, preventive ratio, mean time between failures
Experience	satisfaction, environmental complaints, accessibility, service friction
Efficiency	energy intensity, water intensity, space utilisation, maintenance productivity
Intelligence	sensor coverage, data quality, anomaly detection, response-loop closure
Resilience	critical asset redundancy, recovery time, contingency readiness
Regenerative capacity	asset-health trajectory, reduction of avoidable failure, adaptive capability over time

Again, direction matters more than a single-period score.

3. System Three: Community

3.1 The most underestimated system

Community is the most unconventional component of the Regenerative FM model.

It is also the component that requires the strongest explanation.

The existing framework argues that community engagement is frequently treated as CSR when, operationally, community conditions can influence workforce stability, supplier ecosystems, and customer trust.

This white paper develops that argument further.

A workplace is geographically located but operationally networked.

It draws workers from labour markets.

It draws skills from educational systems.

It depends upon roads and public infrastructure.

It purchases from supplier ecosystems.

It interacts with local authorities.

It creates waste, traffic, employment, and economic activity.

It may consume significant energy and water.

Its employees return each evening to communities.

The organisation exists within a social operating environment.

Community is not outside the system.

It is part of the conditions under which the system operates.

3.2 A workplace does not begin at the workplace door

The conventional facility boundary is legal and physical.

The operating boundary is wider.

Consider workforce stability.

A site may offer adequate employment conditions but still suffer turnover because:

- commuting is difficult;
- housing costs are high;
- local skills are insufficient;
- competitors recruit aggressively;
- family-care constraints are significant;
- or workers see no career pathway.

Some of these issues are outside FM's control.

But they are not necessarily outside FM's awareness.

This distinction matters.

Regenerative FM does not claim that the FM function should solve every community problem.

It proposes that material community dependencies should be identified, understood, and incorporated into operating design.

The appropriate response may then involve HR, local government, vocational institutions, suppliers, or community organisations.

FM's role can be orchestration rather than ownership.

3.3 Local employment as operational strategy

Local recruitment is often framed through social impact.

It can also have operational benefits.

Depending on context, local employment may:

- reduce commuting complexity;
- improve workforce availability;
- increase local knowledge;
- strengthen community relationships;
- create visible economic benefit;
- and build a deeper labour pipeline.

However, local recruitment should not be romanticised.

Local labour markets may not initially contain the required skills.

This creates a strategic choice.

An extractive model responds:

The skills do not exist locally, therefore import them.

A regenerative model asks:

Which capabilities can reasonably be developed locally over time?

That is where vocational education becomes central.

3.4 TVET as workplace infrastructure

Technical and Vocational Education and Training is usually considered an education-policy issue.

From a systems perspective, it is also industrial infrastructure.

An organisation cannot sustainably expand technical operations if the relevant labour market cannot reproduce the competencies those operations require.

This is especially important where technology is changing quickly.

A growing data-centre cluster, for example, requires more than capital investment and buildings.

It requires:

- electrical capability;
- mechanical engineering;
- critical-environment maintenance;
- controls knowledge;
- safety;
- security;
- energy expertise;
- and supervisory competence.

If training systems do not develop at the same rate, physical investment can outrun human capability.

Regenerative FM treats vocational partnerships as a mechanism for strengthening the supply of future capability.

The benefit is not immediate.

That is precisely why conventional short-term scorecards frequently overlook it.

3.5 Procurement as community architecture

FM supply chains extend far beyond labour.

They include:

- technical specialists;
- chemicals;
- consumables;
- equipment;

- uniforms;
- waste partners;
- food;
- landscaping;
- security technology;
- maintenance parts;
- and numerous SMEs.

Procurement creates economic architecture.

The question is not whether every purchase should be local.

That would be commercially and technically unrealistic.

The question is whether procurement decisions consider:

- supplier capability;
- concentration risk;
- local economic value;
- social inclusion;
- environmental performance;
- quality;
- continuity;
- and lifecycle economics.

OECD work on social procurement notes that purchasing decisions can be deliberately structured to create broader social dividends and local employment outcomes, while also identifying barriers that smaller or social-economy organisations face in accessing procurement markets (OECD, 2023).

For Regenerative FM, this leads to a distinction between local purchasing and local supplier development.

Purchasing transfers expenditure.

Supplier development builds capability.

The latter is more regenerative.

3.6 Community resilience and operational resilience

Community resilience literature is complex and lacks a single agreed model, but contemporary reviews consistently identify social, economic, physical, and network-related dimensions as important components (Hall et al., 2023).

For Facility Management, the relevant insight is not that FM should attempt to measure community resilience comprehensively.

It is that workplaces can become vulnerable when surrounding community systems are fragile.

Examples include:

- transport interruption;
- flooding;
- public-health emergencies;
- food or fuel disruption;
- civil disturbance;
- housing instability;
- or loss of local suppliers.

Community resilience can influence operational recovery.

The relationship can also operate in reverse.

Large employers and service organisations may themselves form part of community resilience through:

- employment continuity;
- emergency response;
- procurement;
- infrastructure support;
- and maintenance of essential facilities.

Healthcare FM provides an obvious example.

When a hospital remains functional during disruption, its value extends far beyond its property boundary.

3.7 Social licence and trust

Some facilities also depend upon social acceptance.

Industrial facilities, energy projects, large campuses, and major infrastructure can create local impacts that extend beyond property lines.

Trust matters.

Community trust should not be manipulated as a reputational asset.

It should emerge from credible behaviour:

- responsible employment;
- transparent engagement;
- environmental stewardship;
- fair supplier relationships;
- safety;
- and responsiveness.

This produces another regenerative principle:

Trust is an outcome of system behaviour, not a communications programme.

3.8 Community-system indicators

Illustrative measures include:

Level	Illustrative measures
Operational	local workforce availability, supplier continuity, stakeholder complaints
Employment	percentage local employment where relevant, retention, apprenticeship participation
Capability	vocational partnerships, trainees certified, local skill-pipeline depth
Procurement	local suppliers spend, SME participation, supplier-development progress
Inclusion	participation of underrepresented suppliers or workers
Relationship	stakeholder trust, unresolved community issues, engagement quality
Regenerative capacity	proportion of operationally critical capability that can increasingly be sourced or developed sustainably within the surrounding ecosystem

The final measure is again about direction:

Is the workplace becoming more dependent on scarce external capability, or is it helping build capability around itself?

4. System Four: Natural Environment

4.1 The environment is not an externality

The fourth system is the natural environment.

The common sustainability model often treats the environment as an impact category.

Organisations emit carbon.

Consume energy.

Use water.

Generate waste.

Regenerative thinking adds another perspective:

organisations are also dependent upon natural systems.

They require:

- water;
- energy;
- materials;
- climatic stability;
- land;
- ecosystem services;
- and functioning environmental conditions.

This dependency perspective has become more prominent in contemporary corporate risk frameworks. The Taskforce on Nature-related Financial Disclosures explicitly asks organisations to identify and

assess nature-related dependencies, impacts, risks, and opportunities and integrate them into governance, strategy, and risk management.

For Facility Management, the implication is immediate.

Natural systems are not merely the recipients of workplace impacts.

They are part of workplace operating conditions.

4.2 Energy as both cost and dependency

Energy management is one of the most established environmental responsibilities within FM.

But its interpretation is evolving.

Energy is simultaneously:

- an operating cost;
- a carbon source;
- a resilience dependency;
- a technical parameter;
- and, increasingly, a strategic resource issue.

A regenerative energy strategy goes beyond reducing consumption.

It examines:

- demand avoidance;
- efficiency;
- asset condition;
- load flexibility;
- renewable supply;
- storage;
- critical-load resilience;
- and future energy requirements.

A building that reduces annual consumption but remains highly vulnerable to interruption may be environmentally more efficient while operationally fragile.

Regenerative FM seeks both.

4.3 Water as a strategic operating variable

Water is often undervalued until scarcity occurs.

Many facilities depend upon water for:

- sanitation;
- cooling;
- cleaning;

- landscaping;
- industrial processes;
- healthcare;
- food services;
- and fire systems.

The regenerative approach asks:

- Where does water come from?
- How vulnerable is supply?
- How much is consumed?
- Where can demand be avoided?
- What quality is required for each use?
- Can water be reused?
- What happens under disruption?

This is the difference between efficiency and resilience.

4.4 Waste and circularity

Traditional waste management begins after waste is generated.

Circular thinking begins earlier.

Why does the waste exist?

Can the material be avoided?

Can product specifications change?

Can assets be repaired?

Can consumables be reused?

Can packaging be returned?

Can suppliers participate in take-back schemes?

Can maintenance extend equipment life?

This moves FM from waste disposal into resource design.

The circular-economy literature has long emphasised the need to retain value in materials and products rather than treat economic activity as a linear extraction–use–disposal sequence (Geissdoerfer et al., 2017).

In FM, circularity can be practical rather than abstract.

Maintenance is already a circular activity when it extends useful asset life.

Refurbishment can delay replacement.

Correct cleaning chemistry can reduce packaging and water.

Furniture can be redeployed.

Parts can be recovered.

Waste data can reveal inefficient procurement.

Regenerative FM connects these actions into a resource strategy.

4.5 Climate adaptation

Decarbonisation is essential.

But a low-carbon workplace can still be climate-vulnerable.

Physical climate risks may include:

- heat;
- flooding;
- water stress;
- storm;
- sea-level change;
- wildfire;
- air-quality deterioration;
- or cascading infrastructure disruption.

Facility Management sits directly within adaptation.

Adaptation can include:

- asset protection;
- redundancy;
- drainage;
- cooling strategy;
- emergency planning;
- water resilience;
- backup systems;
- landscape interventions;
- maintenance regimes;
- and revised operational thresholds.

This creates an important distinction:

Mitigation reduces contribution to climate change.

Adaptation reduces vulnerability to its effects.

A regenerative model requires both.

4.6 Biodiversity and nature

Biodiversity remains less mature as an FM management domain than energy or carbon.

That should not justify ignoring it.

Facility portfolios affect nature through:

- land use;
- landscaping;
- water;
- lighting;
- chemicals;
- pest management;
- materials;
- waste;
- and supply chains.

The appropriate response depends heavily on location.

A dense urban office and a large industrial estate will not have equivalent biodiversity exposure.

This illustrates one of regenerative practice's central principles: **place matters.**

Nature-related risk frameworks such as TNFD similarly emphasise location because dependencies and impacts vary geographically.

Regenerative FM should avoid generic biodiversity programmes.

Intervention should follow materiality.

4.7 Environmental-system indicators

Level	Illustrative measures
Operational	energy, water, waste, environmental incidents
Efficiency	energy intensity, water intensity, waste diversion, refrigerant loss
Climate	carbon emissions, adaptation actions, exposure of critical assets
Circularity	reuse, repair, asset-life extension, material recovery
Nature	site-specific dependency/impact measures where material
Resilience	energy and water contingency, climate-event readiness
Regenerative capacity	declining resource dependency, increasing adaptive capacity, improving ecological condition where FM has meaningful influence

The final category requires caution.

FM should not claim environmental regeneration where evidence only demonstrates efficiency.

Reducing water consumption is an improvement.

Restoring a degraded watershed would be regenerative.

They are not equivalent.

Terminology should reflect evidence.

PART V

THE SYSTEM, NOT THE FOUR BOXES

1. Why the Relationships Matter More Than the Categories

The four systems provide structure.

They do not yet provide theory.

If People, Workplace, Community, and Environment are simply presented as four pillars, Regenerative FM becomes vulnerable to the criticism that it is merely ESG with different language.

The distinctive proposition emerges only when their relationships are made explicit.

The system can be represented conceptually as:

People ↔ Workplace ↔ Community ↔ Environment

Every arrow is two-directional.

People shape workplaces.

Workplaces shape people.

Communities supply people.

Employment affects communities.

Environmental conditions affect workplaces.

Workplaces affect environmental conditions.

Community infrastructure affects environmental resilience.

Environmental disruption affects communities.

These interactions can generate:

- reinforcing loops;
- balancing loops;
- delays;
- trade-offs;
- and unintended consequences.

The objective of Regenerative FM is not to maximise every variable simultaneously.

That would be impossible.

The objective is to design decisions with greater awareness of their system consequences.

2. Causal Pathways

2.1 Pathway One: Capability to asset performance

Consider technical workforce development.

Vocational development

↓

higher technical capability

↓

better diagnosis

↓

higher preventive-maintenance quality

↓

lower repeat failure

↓

higher asset reliability

↓

lower reactive workload

↓

greater time available for preventive work

↓

further reliability improvement.

This can become a reinforcing loop.

But the opposite can also occur:

training reduction

↓

skills erosion

↓

misdiagnosis

↓

repeat failure

↓

higher reactive workload

↓

less time for training

↓

further skills erosion.

The same system can move upward or downward.

This is what makes trajectory important.

2.2 Pathway Two: Employment stability to service performance

A second example:

responsible employment

↓

stronger retention

↓

greater experience

↓

better service consistency

↓

higher customer trust

↓

greater contract stability

↓

greater willingness to invest in people

↓

stronger retention.

Again, the reverse is possible.

Aggressive cost compression can initiate a downward loop.

2.3 Pathway Three: Maintenance to environmental performance

Asset maintenance also links Workplace and Environment.

correct equipment condition

↓

higher operating efficiency

↓

lower energy consumption

↓

lower operating cost and emissions

↓

greater budget headroom

↓

continued maintenance investment.

This illustrates why environmental performance should not be isolated in a sustainability team.

Engineering quality can be climate action.

2.4 Pathway Four: Community capability to workforce resilience

vocational partnership

↓

larger skilled labour pipeline

↓

reduced recruitment scarcity

↓

greater workforce stability

↓

stronger operational continuity

↓

greater local economic opportunity

↓

higher attractiveness of vocational pathway

↓

stronger labour pipeline.

This is a potential regenerative loop.

It should still be tested empirically rather than assumed.

2.5 Pathway Five: Workplace quality to people outcomes

improved indoor environmental conditions

↓

higher comfort and satisfaction

↓

potential improvements in wellbeing and work performance

↓

stronger workplace experience.

The word potential matters.

As contemporary systematic reviews demonstrate, indoor-environment relationships vary materially by context and evidence quality.

Regenerative FM should not convert correlation into guaranteed financial return.

3. Trade-Offs: Regeneration Is Not Frictionless

Systems create synergies.

They also create *conflict*.

A serious regenerative framework must address trade-offs explicitly.

Examples include:

- higher ventilation may improve air quality but increase energy demand;
- additional redundancy can improve resilience but increase embodied material and capital cost;
- local procurement may increase social value but reduce access to specialised global capability;
- higher wages may improve stability while increasing near-term contract cost;
- equipment replacement may improve efficiency but create embodied-carbon impacts;

- increased data collection may improve operations while creating privacy or cybersecurity concerns.

Regenerative FM requires trade-off governance.

The question is not:

“Which option is regenerative?”

The better questions are:

- What improves?
- What worsens?
- For whom?
- Over what timeframe?
- What evidence supports the assessment?
- Can adverse effects be mitigated?
- Who has authority to decide?

This is one of the principal differences between serious systems thinking and sustainability rhetoric.

4. The Regenerative Value Engine™

The original Regenerative Value Engine™ provides the principal practitioner architecture behind this white paper.

Its current logic is:

Organisational Purpose

↓

People • Workplace • Community • Environment

↓

Integrated Operations • Technology • Data

↓

Anticipate • Prevent • Optimise • Adapt

↓

Business Outcomes • Shared Value • Resilience.

The framework is retained, but the causal mechanism can now be made more explicit.

4.1 A six-layer model

Layer 1 — Organisational purpose

Why does the organisation exist?

What outcomes must the workplace enable?

This prevents Regenerative FM from becoming detached from enterprise strategy.

Layer 2 — System dependencies

Which People, Workplace, Community and Environmental conditions are materially necessary for performance?

This is the diagnostic layer.

Layer 3 — Capability

What capabilities must exist to manage those dependencies?

Examples:

- engineering;
- leadership;
- data;
- supplier networks;
- vocational capability;
- risk management;
- sustainability expertise.

Layer 4 — Integration

How do information, decisions and responsibilities connect across the system?

Technology and governance sit here.

Layer 5 — Operational action

- Anticipate.
- Prevent.
- Optimise.
- Adapt.
- Regenerate.

Layer 6 — Outcomes and feedback

Operational outcomes are measured.

System effects are observed.

Learning feeds back into future decisions.

The engine is cyclical rather than linear.

4.2 Exhibit 2 — Reconstructed Regenerative Value Engine

ORGANISATIONAL PURPOSE

Performance • Resilience • Sustainable Growth • Enterprise Value

↓

FOUR INTERDEPENDENT SYSTEMS

People ↔ Workplace ↔ Community ↔ Environment

↓

SYSTEM CAPABILITIES

Skills • Assets • Partnerships • Resources • Governance

↓

INTEGRATION LAYER

Technology • Data • Information Flow • Decision Rights

↓

OPERATING LOGIC

Anticipate → Prevent → Optimise → Adapt → Regenerate

↓

OUTCOMES

Operational Performance

Human Capability

Social Value

Environmental Performance

Resilience

Future Readiness

↓

LEARNING AND FEEDBACK

Measure → Learn → Redesign → Reinvest

↺ **back into system capability**

The addition of the feedback loop is important.

Without it, the model describes delivery.

With it, the model describes development.

PART VI

ANTICIPATION, RESILIENCE AND PRESILIENCE

1. From Resilience to Anticipatory Capability

Organisations frequently discover risk through disruption.

A system fails.

The organisation responds.

A lesson is documented.

Controls are strengthened.

This sequence is necessary but expensive.

A more mature approach identifies conditions that are weakening before the failure becomes visible.

This is where anticipatory capability becomes strategically important.

Duchek's capability-based model of organisational resilience explicitly includes anticipation alongside coping and adaptation, reinforcing the argument that resilience begins before disruption rather than after it (Duchek, 2020).

Regenerative FM extends that principle into day-to-day workplace management.

The relevant question becomes:

What is becoming weaker that has not failed yet?

Possible examples include:

- maintenance backlog;
- aging workforce;
- single-source supplier dependence;
- declining equipment efficiency;
- increasing heat exposure;
- training obsolescence;
- water stress;
- declining engagement;
- knowledge concentration;
- cyber-physical dependency.

These are not necessarily incidents.

They are system signals.

2. A Maturity Continuum for Risk and Operations

The progression can be represented as follows:

Level	Operating logic	Typical question
Reactive	respond after event	What failed?
Preventive	reduce known failure	How do we stop recurrence?
Predictive	detect emerging failure	What is likely to fail?
Adaptive	modify response	How do we adjust?
Anticipatory	prepare before pressure	What conditions are changing?
Regenerative	strengthen system capacity	How do we become more capable because of what we do now?

The final stage does not eliminate the earlier ones.

A regenerative organisation still reacts when necessary.

It still uses preventive maintenance.

It still predicts failures.

Maturity means increasing the range of available responses.

3. Presilience® and Regenerative FM

The concept of presilience has been used in your earlier practitioner work as a way to describe capability that develops ahead of disruption rather than solely responding to it.

Within this white paper it should be treated carefully.

Presilience® should not be presented as a universally established academic construct equivalent to resilience.

Instead, it can be positioned as an applied risk-management lens that asks:

Can the organisation identify emerging conditions early enough to build capability before they become disruptive?

This complements Regenerative FM because regeneration is intrinsically forward-looking.

A system cannot be described as becoming stronger if it is evaluated only against yesterday's risks.

4. Three Horizons of Workplace Risk

A useful Regenerative FM risk architecture is to distinguish three horizons.

Horizon 1 — Current operational risk

Known hazards.

Examples:

- equipment failure;
- safety events;
- cleaning breakdown;

- security incident;
- fire risk;
- utility interruption.
- Management response:
- controls, maintenance, supervision, compliance.

Horizon 2 — Emerging systemic risk

Conditions becoming materially relevant.

Examples:

- skills shortage;
- aging infrastructure;
- energy volatility;
- supplier concentration;
- rising heat;
- regulatory transition;
- cyber dependency.
- Management response:
- scenario planning, capability development, diversification, investment.

Horizon 3 — Structural future risk

Long-term shifts that may alter the operating model.

Examples:

- AI-enabled automation;
- major climate migration;
- water-system transformation;
- new building-energy regulation;
- demographic change;
- radical shifts in work patterns.

Management response:

strategic sensing, experimentation, portfolio redesign.

The discipline is not prediction.

It is preparedness.

PART VII

ORGANISATIONAL INTELLIGENCE

1. The Workplace as an Information System

A facility can be technically sophisticated and organisationally unintelligent.

This occurs when information exists but does not move.

Examples are common:

- technicians know an asset is deteriorating;
- finance knows replacement capital is constrained;
- procurement knows parts availability is worsening;
- operations know disruption would be critical;
- but no mechanism combines these signals into a timely decision.

The problem is not information scarcity.

It is information architecture.

This leads to another central proposition:

Organisational intelligence is not merely the sum of individual intelligence. It is an emergent property of how information, authority, learning, and trust move through the system.

For Facility Management, this matters because workplace operations generate enormous amounts of information.

Work orders.

Sensor data.

Inspection findings.

Complaints.

Risk assessments.

Utility consumption.

Incident reports.

Supplier performance.

Attendance.

Audit findings.

Asset condition.

The challenge is not collecting everything.

The challenge is converting information into appropriate action.

2. Decision Latency

One useful concept is decision latency:

the time between emergence of relevant information and an effective decision.

A long decision latency can convert a manageable condition into a crisis.

Examples:

- a small leak becomes structural damage;
- a minor vibration becomes asset failure;
- a staffing shortage becomes service breakdown;
- a community grievance becomes reputational conflict;
- an energy anomaly becomes months of avoidable consumption.

Regenerative FM should measure not only response time after a work order is created, but the broader speed through which the organisation recognises and acts upon changing conditions.

This is organisational sensing.

3. Trust as operating infrastructure

Trust affects information flow.

Where trust is low:

- employees withhold concerns;
- functions protect territory;
- suppliers hide problems;
- customers escalate rather than collaborate;
- and management receives filtered information.

Where trust is stronger:

- weak signals surface earlier;
- errors are reported;
- learning accelerates;
- and cross-functional coordination becomes easier.

Trust has operational value.

But it cannot be mandated.

It emerges from repeated system behaviour.

If employees report problems and nothing happens, trust declines.

If suppliers disclose risks and are punished commercially, transparency declines.

If leaders ask for bad news but react defensively, information quality deteriorates.

Regenerative FM should treat trust not as culture rhetoric but as a condition affecting system intelligence.

4. Technology and Artificial Intelligence

AI can significantly increase FM analytical capacity.

Potential applications include:

- fault detection;
- predictive maintenance;
- energy optimisation;
- occupancy analytics;
- workflow automation;
- computer vision;
- risk sensing;
- knowledge retrieval;
- and decision support.

But AI also amplifies the quality of the system into which it is introduced.

Poor data produces poor inference.

Unclear accountability produces automated ambiguity.

Biased workforce data can reproduce bias.

Excessive automation can erode human judgement.

Cybersecurity exposure can increase.

A regenerative principle applies:

AI should augment system capability, not merely automate activity.

The relevant measure is not the number of AI applications deployed.

It is whether AI improves:

- decision quality;
- speed;
- anticipation;
- learning;
- resource use;
- or human capability.

5. Exhibit 3 — The Regenerative Information Loop

SENSE

People • Sensors • Customers • Assets • Community • Environment

↓

INTERPRET

Context • Analytics • Human judgement • AI

↓

DECIDE

Authority • Priorities • Risk • Trade-offs

↓

ACT

Operations • Maintenance • Training • Procurement • Investment

↓

MEASURE

Operational outcome • System outcome • unintended consequence

↓

LEARN

What changed?

What worked?

What weakened?

↓

ADAPT

Redesign process, capability, technology, or governance

↺

This loop is the nervous system of Regenerative FM.

Without it, the four-system model remains static.

With it, the workplace becomes capable of learning.

PART VIII

MEASUREMENT

1. The Measurement Problem

Regenerative FM will ultimately succeed or fail on measurement.

The concept is relatively easy to describe.

It is considerably harder to demonstrate.

The difficulty arises because many important outcomes:

- emerge slowly;
- have multiple causes;
- cross organisational boundaries;
- are difficult to monetise;
- and may not be attributable to FM alone.

This means conventional KPI logic is insufficient.

But abandoning measurement would be worse.

The correct response is to establish different levels of evidence.

2. Three Levels of Measurement

Level 1 — Operational performance

This establishes whether basic FM is working.

Measures include:

- SLA;
- uptime;
- quality;
- cost;
- safety;
- response;
- compliance;
- maintenance;
- security;
- hygiene.

Without Level 1 performance, regenerative claims have little credibility.

Level 2 — System outcomes

This evaluates the condition of People, Workplace, Community and Environment.

Examples:

- workforce retention;
- technical capability;
- asset health;
- occupant experience;
- local supplier participation;
- energy intensity;
- carbon;
- water;
- waste;
- workforce mobility.

These measures show broader outcomes but not necessarily causation.

Level 3 — Regenerative capacity

This is the distinctive level.

It asks whether future capability is increasing.

Examples:

- Is the technical workforce better able to manage future technology?
- Is critical-asset health improving rather than merely being maintained?
- Is the local labour pipeline becoming deeper?
- Are suppliers becoming more capable?
- Is dependency on scarce resources declining?
- Is climate resilience increasing?
- Is organisational learning reducing repeat failure?

Level 3 is about capacity trajectory.

3. Leading and Lagging Indicators

Regenerative measurement also requires distinguishing lagging and leading indicators.

Turnover is lagging.

Career-pathway participation may be leading.

Asset failure is lagging.

Condition deterioration is leading.

Energy consumption is lagging.

Equipment efficiency degradation may be leading.

Supplier failure is lagging.

Financial-health or concentration indicators may be leading.

Community conflict is lagging.

Declining stakeholder trust may be leading.

The more anticipatory the operating model becomes, the more important leading indicators become.

4. The Regenerative Workplace Readiness Index™

The existing Regenerative Workplace Readiness Index™ evaluates organisational maturity across People, Workplace, Community and Environment and classifies maturity across five levels:

1. Basic Workplace
2. Reactive Workplace
3. Managed Workplace
4. Integrated Workplace
5. Regenerative Workplace.

This architecture should be retained.

But for white-paper purposes, the distinction between assessment framework and validated index remains critical.

At present, RWRI should be described as:

a structured practitioner maturity framework for evaluating the degree to which workplace systems are managed in an integrated and capacity-building manner.

It should **not** yet be described as:

- a predictive scientific index;
- a validated psychometric instrument;
- or a proven predictor of enterprise value.

Those claims would require further empirical research.

5. RWRI Measurement Architecture

Each dimension should contain six fields.

Field	Purpose
Construct	What is being assessed?
Indicator	What observable variable represents it?
Evidence	What proves the score?
Scale	How is maturity graded?
Owner	Who is accountable?
Direction	Is capability improving or deteriorating?

For example:

People — workforce capability

Construct: Technical capability resilience.

Indicator: Percentage of critical technical competencies with at least two competent role holders.

Evidence: Competency assessment and certification records.

Scale: 1–5 maturity.

Owner: Operations/HR.

Direction: Twelve-month trend.

This is significantly stronger than relying on training hours.

Training is an input.

Capability is the intended outcome.

6. Avoiding False Precision

A maturity score such as 82/100 can create an appearance of scientific certainty.

That certainty may not exist.

Regenerative assessment should be explicit about:

- weighting;
- data confidence;
- subjectivity;
- missing evidence;
- and uncertainty.

One possibility is to accompany each RWRI score with a confidence rating.

For example:

RWRI = 3.6 / 5

Evidence confidence = High

This distinguishes measurement maturity from workplace maturity.

Such transparency would materially strengthen the framework.

7. Attribution versus Contribution

A further methodological challenge is causation.

Suppose turnover declines.

Was Regenerative FM responsible?

Possibly.

But turnover may also be affected by:

- labour-market conditions;
- compensation;
- leadership;
- economic cycles;
- competitor hiring;
- or HR policy.

Similarly, energy performance may improve because of:

- FM intervention;
- weather;
- occupancy;
- production volume;
- capital upgrades;
- or tariff changes.

The correct language is often contribution, not attribution.

Regenerative FM should use contribution analysis where strict causal inference is not possible.

This protects the framework from overstated impact claims.

PART IX

ENTERPRISE VALUE

1. Why Regenerative FM Must Make a Business Case

A conceptual framework becomes strategically relevant only when it can explain how organisational value is created, protected, or placed at risk.

Regenerative FM cannot rely on moral aspiration alone.

The case must connect to enterprise outcomes.

Those outcomes may include:

- reliability;
- productivity;
- continuity;
- risk reduction;
- cost predictability;
- asset life;
- workforce stability;
- customer experience;
- regulatory readiness;
- reputation;
- social licence;
- resource efficiency;
- and long-term adaptability.

This does not mean that every social or environmental outcome should be reduced to a financial return.

Some outcomes matter because they are intrinsically important.

Others matter because they create obligations.

Still others materially affect enterprise performance.

A rigorous business case should distinguish among them.

The appropriate question is not:

"*Can every regenerative outcome be monetised*?"

It is:

"*Which outcomes affect enterprise value, which create wider stakeholder value, which fulfil obligations, and where do those categories overlap*?"

2. From Service Cost to Enterprise Capability

Facility Management is often visible in financial statements as operating expenditure.

That accounting location influences managerial perception.

A cost line naturally attracts cost-reduction attention.

The problem is that an accounting category does not necessarily describe the economic function of the expenditure.

Maintenance is a cost.

But poor maintenance can destroy asset value.

Training is a cost.

But capability failure can stop operations.

Cleaning is a cost.

But hygiene failure in a healthcare environment can create material clinical and reputational consequences.

Security is a cost.

But security failure can create catastrophic loss.

Energy-management capability is a cost.

But inefficient operation increases both expenditure and environmental exposure.

FM expenditure contains at least four economically different categories:

- consumption: activity necessary to operate;
- protection: expenditure that prevents loss;
- capability: expenditure that increases future performance;
- regeneration: expenditure that strengthens the wider system upon which future performance depends.

The categories can overlap.

A technical training programme, for example, may simultaneously improve current service delivery, reduce future failure risk, and develop workforce capability.

This distinction matters because indiscriminate cost reduction can remove capability while appearing financially efficient.

3. The CFO Lens: Total Cost Rather Than Visible Cost

The CFO perspective is central to the commercial credibility of Regenerative FM.

Finance requires discipline.

Claims about long-term value must survive questions such as:

- What is the baseline?

- What changes?
- What does the intervention cost?
- What measurable benefit follows?
- Over what period?
- What uncertainty exists?
- What would have happened without the intervention?
- Where is value captured?
- Who bears the cost?

These questions should be welcomed.

They force regenerative claims away from rhetoric.

A useful distinction is between visible cost and total system cost.

Visible FM cost may include:

- labour;
- materials;
- management fees;
- maintenance;
- utilities;
- technology;
- and contracted services.

Total system cost can also include:

- downtime;
- turnover;
- recruitment;
- lost productivity;
- energy waste;
- asset degradation;
- emergency intervention;
- compliance failure;
- customer dissatisfaction;
- supplier failure;
- and disruption.

The central economic proposition is:

The lowest visible cost is not necessarily the lowest total cost.

This is not a uniquely regenerative argument. Lifecycle costing and total-cost-of-ownership approaches have long made related points.

Regenerative FM extends the boundary further by asking whether social, workforce and environmental dependencies also create future costs or capabilities.

4. The COO Lens: Continuity and Operational Reliability

For a COO, the most compelling regenerative argument may not be sustainability.

It may be continuity.

Operations depend upon:

- people;
- assets;
- utilities;
- suppliers;
- information;
- technology;
- and external infrastructure.

The four-system model maps directly onto these dependencies.

A highly capable workforce with unreliable assets cannot sustain operations.

Reliable assets without skilled people remain vulnerable.

Both can fail if energy, water, or critical supply chains are disrupted.

A technically sound operation can also become unstable if labour-market conditions deteriorate.

The regenerative business case reframes continuity from a facility-specific issue into a systems issue.

This is particularly relevant in:

- manufacturing;
- healthcare;
- data centres;
- logistics;
- energy;
- financial services;
- and other operations where interruption has substantial consequences.

5. The CHRO Lens: Workforce Capability and Retention

For HR leadership, Regenerative FM intersects with several strategic concerns:

- employee experience;
- health and safety;
- wellbeing;
- skills;
- inclusion;
- career mobility;
- retention;
- and future workforce capability.

The FM environment materially shapes the daily employee experience.

But the relationship runs deeper.

In labour-intensive FM operations, the service provider itself can be a significant workforce-development platform.

Frontline jobs can remain low-mobility roles, or they can become structured entry points into technical, supervisory, and professional careers.

That is not merely an HR issue.

The choice affects operational capability.

If an organisation continuously recruits low-skilled labour but fails to deepen capability internally, growth increases dependency on the external labour market.

A regenerative model seeks to increase the internal reproduction of skills.

6. The Sustainability Lens: From Reporting to Operating

For sustainability leaders, FM is where many commitments become physical reality.

Net-zero targets require operational changes.

Water targets require operating discipline.

Waste targets require procurement and site-level behaviour.

Circularity requires asset and material decisions.

Climate adaptation requires building interventions.

Nature-related commitments may require location-specific FM responses.

The distinction is significant:

Corporate sustainability sets direction. Facility operations convert direction into repeated behaviour.

This is why FM should not be introduced only after ESG strategy has been written.

Operational feasibility should inform strategy upstream.

7. The Procurement Lens: Price, Quality and System Consequences

Procurement plays an unusually influential role in FM because contract design shapes provider behaviour.

The contract determines:

- what is measured;
- how risk is allocated;
- whether investment is rewarded;

- how frequently competition is reopened;
- whether workforce development is affordable;
- whether innovation has commercial upside;
- and whether suppliers can make long-term capability investments.

This creates one of the most important institutional questions in the white paper:

Can an organisation procure regenerative outcomes through a commercial model designed primarily to minimise short-term service cost?

The answer is **sometimes no.**

8. The Lowest-Cost Paradox

Procurement discipline is necessary.

Competitive pressure can remove inefficiency.

But cost competition becomes destructive when it rewards bids that can only be sustained by reducing the very capabilities upon which performance depends.

A simplified sequence illustrates the risk:

aggressive price pressure

↓

lower labour or supervision investment

↓

reduced training and management capacity

↓

higher turnover or lower service quality

↓

more operational instability

↓

increased contract management

↓

higher hidden customer cost.

The initial procurement saving can be partially or entirely transferred elsewhere.

This is not an argument against competitive procurement.

It is an argument for better cost definition.

9. Contract Duration and the Investment Problem

Many regenerative interventions have delayed returns.

Examples include:

- vocational development;
- supplier capability;
- preventive maintenance;
- digital integration;
- energy optimisation;
- community partnerships;
- and workforce progression.

A provider facing a short, highly contestable contract may have weak incentives to make investments whose benefits will be realised after the contract expires.

This creates a classic time-horizon problem.

The customer wants long-term value.

The supplier is commercially exposed over the short term.

If the contract does not align the two horizons, underinvestment becomes rational.

Regenerative procurement requires explicit attention to:

- contract length;
- renewal mechanisms;
- gainsharing;
- investment recovery;
- intellectual-property treatment;
- data ownership;
- and outcome incentives.

10. Procurement as an Operating-System Design Choice

A contract does more than buy services.

It creates rules.

Those rules determine behaviour.

For example:

- A contract paying only for headcount encourages labour supply.
- A contract rewarding outputs encourages productivity.
- A contract rewarding energy reduction changes technical priorities.
- A contract requiring social-value outcomes can influence recruitment and suppliers.
- A contract sharing savings can encourage investment.
- A contract penalising every disclosed problem may suppress transparency.

Procurement is partly governance design.

This has important implications for Regenerative FM.

If a customer wants:

- innovation;
- continuous improvement;
- workforce development;
- social value;
- and environmental improvement,
- those outcomes need to be reflected in the commercial architecture.

Otherwise, the operating model and the procurement model contradict each other.

11. Social Procurement and Facility Management

Contemporary research provides empirical support for FM's potential to generate social value through procurement and partnerships.

Loosemore, Osborne, and Higgon (2021), examining a major FM organisation, found evidence that social procurement could generate affective, cognitive, behavioural, and situational social-value outcomes and highlighted the importance of hybrid partnerships involving business, government, community, education, and not-for-profit actors.

This finding is important because it supports one of the more unconventional propositions in Regenerative FM:

FM can influence social outcomes through ordinary operating activity rather than only through CSR programmes.

Related built-environment research also shows that social value is increasingly being incorporated into project appraisal and procurement, while measurement remains inconsistent and methodologically difficult (Watson et al., 2022).

This reinforces the need for measurement discipline.

A contract cannot simply claim social value because it employs local people.

The relevant questions are:

- What changed?
- For whom?
- Compared with what?
- For how long?
- What evidence exists?

12. Enterprise-Value Pathways

Regenerative FM should avoid claiming direct enterprise value without explaining the causal pathway.

A more credible model identifies intermediate mechanisms.

Example 1 — Workforce development

training investment

↓

higher technical competence

↓

better maintenance quality

↓

fewer repeat failures

↓

higher uptime

↓

lower disruption cost.

Example 2 — Employee stability

responsible employment

↓

lower avoidable turnover

↓

higher experience retention

↓

greater service consistency

↓

lower recruitment and retraining burden

↓

better customer outcomes.

Example 3 — Energy optimisation

technical optimisation

↓

lower energy intensity

↓

lower operating expenditure and emissions

↓

lower exposure to energy volatility

↓

greater operational resilience.

Example 4 — Local supplier development

supplier capability investment

↓

greater local technical capacity

↓

lower dependency on scarce external sources

↓

shorter response pathways

↓

greater supply resilience.

Example 5 — Digital integration

better condition data

↓

earlier anomaly detection

↓

planned intervention

↓

reduced catastrophic failure

↓

lower disruption and emergency cost.

The business case becomes credible when these pathways are evidence-based rather than merely asserted.

13. A Regenerative Value Ledger

A practical enterprise framework can classify value across six categories.

Value domain	Examples
Financial	lifecycle cost, avoided loss, energy savings
Operational	uptime, reliability, service quality
Human	capability, safety, retention, mobility
Social	employment, supplier development, community outcomes
Environmental	emissions, water, waste, resource resilience
Strategic	adaptability, reputation, regulatory readiness

The purpose is not to monetise every outcome.

The purpose is to prevent outcomes from disappearing simply because they sit outside the traditional cost ledger.

14. When Regenerative FM Should Not Be Used

A credible business framework must also define when the model is excessive.

Regenerative FM should not automatically be applied at maximum complexity to every site.

A small, low-risk facility may require:

- safe operation;
- regulatory compliance;
- basic environmental controls;
- and reliable services.

Building an elaborate community or biodiversity architecture for such a site may add complexity without material value.

The principle should be:

Regeneration must follow materiality.

The scale of intervention should correspond to:

- operational criticality;
- environmental impact;
- workforce dependency;
- community interface;
- asset complexity;
- regulatory exposure;
- and strategic importance.

This prevents the framework from becoming bureaucratic.

PART X

SECTOR APPLICATIONS

1. Why Sector Context Matters

Regenerative FM is not a standard service bundle.

The four systems remain constant: People, Workplace, Community, and Environment. But their relative materiality changes by sector.

Their relative importance changes.

A data centre and hospital share requirements for reliability, energy, and technical capability.

But their risk profiles differ.

A hospital has direct patient-safety and infection-control consequences.

A manufacturing facility may prioritise production reliability and workforce safety.

A bank may emphasise security, customer experience, and distributed-estate consistency.

An industrial estate may have more substantial community and environmental dependencies.

This is why the existing white paper's sector examples should be understood as application architectures, not generic promises.

2. Manufacturing

Manufacturing converts facility performance directly into production performance.

Failures in:

- utilities;
- HVAC;
- compressed air;
- power;
- water;
- critical equipment;
- clean environments;
- security;
- or workplace safety

can affect output.

The business challenge is not merely maintaining the facility.

It is protecting production capability.

The existing Regenerative FM framework identifies manufacturing outcomes across workforce productivity and safety, equipment uptime, local workforce and supplier resilience, and lower energy and carbon intensity.

The white-paper model deepens these relationships.

People

- technical skills;
- safety capability;
- supervisory strength;
- future automation capability.

Workplace

- asset reliability;
- utility continuity;
- OEE-supporting systems;
- predictive maintenance.

Community

- local labour pipeline;
- supplier development;
- community legitimacy.

Environment

- energy intensity;
- water;
- waste;
- emissions;
- climate exposure.

The regenerative question becomes:

Can the factory increase production resilience while reducing resource dependency and strengthening the capability surrounding it?

3. Healthcare

Healthcare exposes the limitations of purely cost-based FM particularly clearly.

Facility failure can affect clinical activity.

Cleaning can affect infection-control conditions.

Power reliability can affect critical equipment.

Water quality matters.

Indoor environmental quality matters.

Security matters.

Patient experience matters.

The current framework identifies staff wellbeing, facility reliability, infection control, community trust, and safer resource management as interconnected healthcare outcomes.

A regenerative healthcare model would prioritise:

- **People:** capable support workforce, safety, wellbeing.
- **Workplace:** critical-system reliability, infection prevention, environment of care.
- **Community:** local employment, public trust, continuity of essential services.
- **Environment:** waste, water, energy, and climate resilience.

The hierarchy is critical.

Patient safety and clinical continuity remain dominant.

Environmental initiatives must be designed around them.

4. Data Centres

Data centres provide another useful example because they combine extreme technical reliability requirements with significant energy and water considerations.

The existing model identifies maximum uptime, technical capability, digital resilience, and lower PUE/carbon as central outcomes.

The four-system application becomes:

People

- critical-environment technical skills;
- 24/7 workforce capability;
- incident discipline;
- specialist succession.

Workplace

- uptime;
- redundancy;
- asset-health management;
- controls;
- physical security.

Community

- local technical-skill pipeline;
- supplier ecosystem;
- infrastructure interface.

Environment

- PUE;
- water usage;
- power sourcing;
- heat;
- carbon;
- energy-system resilience.

This is particularly relevant in rapidly growing markets.

If data-centre investment grows faster than local engineering capability, the system becomes increasingly dependent upon scarce imported expertise.

A regenerative approach would treat capability development as part of infrastructure planning rather than a downstream staffing issue.

5. Banking and Financial Services

The existing framework positions banking around secure and resilient workplaces, employee wellbeing, customer experience, community engagement, and sustainable operations.

The sector also illustrates the distributed-estate problem.

A bank may operate:

- headquarters;
- branches;
- data environments;
- cash-handling sites;
- and customer-facing facilities

across many locations.

Consistency becomes a system challenge.

A regenerative banking model can focus on:

- workplace standardisation;
- security;
- energy performance;
- branch resilience;
- inclusive customer access;
- employee experience;
- local supplier capability;
- and portfolio-level data.

The regenerative value is not necessarily created through one flagship building.

It can emerge through repeated improvement across the network.

6. Logistics and Distribution

Logistics depends upon flow.

That makes it especially compatible with regenerative systems thinking.

People must move.

Vehicles move.

Goods move.

Information moves.

Energy moves.

Disruption at one node can affect an entire network.

Regenerative priorities include:

People

- driver and warehouse safety;
- technical capability;
- workforce retention.

Workplace

- warehouse reliability;
- dock operations;
- fire safety;
- security;
- automation.

Community

- local employment;
- transport relationships;
- supplier networks.

Environment

- fleet interfaces;
- energy;
- packaging;
- waste;
- warehouse efficiency.

A regenerative logistics facility should be judged partly by its ability to increase network resilience.

7. Energy and Resources

Energy and resource sectors often operate in geographically complex environments.

They can have significant interaction with:

- communities;
- environmental systems;
- technical supply chains;
- local government;
- and specialist workforces.

FM in such environments cannot be separated from these dependencies.

Key priorities can include:

- remote-site workforce wellbeing;
- critical infrastructure reliability;
- water;
- energy;
- waste;
- security;
- emergency response;
- local supplier capability;
- and community interface.

This sector makes particularly clear why Community and Environment cannot remain external to the FM model.

8. Commercial Offices

Commercial workplaces typically have lower operational criticality than hospitals or data centres but stronger emphasis on human experience.

Potential focus areas include:

- indoor environmental quality;
- employee experience;
- space utilisation;
- energy;
- hybrid-work patterns;
- accessibility;
- amenities;
- technology;
- and workplace services.

The regenerative question becomes:

Can the workplace improve human performance and experience while reducing resource intensity and adapting continuously to how work changes?

This is different from making offices more luxurious.

The focus is *system fitness*.

9. Education

Educational institutions combine:

- workplace;
- learning environment;
- community institution;
- and long-lived estate.

Facilities can directly influence:

- student experience;
- staff wellbeing;
- accessibility;
- energy consumption;
- safety;
- and institutional reputation.

Social-value research also suggests that FM operations can play a wider role in social outcomes across long-duration built assets rather than only during construction. Troje's study of Swedish housing organisations similarly demonstrates how operations-phase interventions can create employability, skills, and wellbeing outcomes, while also exposing the difficulty of linking social and financial value.

For educational estates, vocational partnerships could become especially powerful because the institution can simultaneously be:

- customer;
- educator;
- employer;
- and community anchor.

10. Special Economic Zones (State Township)

SEZs deserve separate treatment because they create a system at greater scale than a single facility.

An SEZ integrates:

- multiple employers;
- infrastructure;
- utilities;
- workforce;
- housing;
- transport;
- communities;
- suppliers;

- natural resources;
- and governance.

The regenerative logic can be applied at district level.

People:

local workforce development.

Workplace:

high-performing facilities and infrastructure.

Community:

employment, suppliers, social participation.

Environment:

water, energy, waste, landscape, and climate resilience.

This becomes a particularly relevant Indonesian application.

PART XI

THE INDONESIA CONTEXT

1. Indonesia as a Strategic Test Case

The current Regenerative FM framework already argues that Indonesian FM cannot simply import models designed for mature markets and that local relevance must combine international standards with capability development and local partnerships.

That proposition deserves a full chapter because Indonesia provides an unusually strong test of the model.

Indonesia combines:

- large-scale urbanisation;
- industrial expansion;
- demographic scale;
- archipelagic geography;
- infrastructure growth;
- energy transition;
- climate exposure;
- significant regional variation;
- and substantial workforce-development requirements.

These conditions make fragmentation particularly costly.

Physical development can move faster than institutional capability.

Technology can move faster than skills.

Investment can move faster than supplier ecosystems.

Environmental pressure can move faster than adaptation.

Regenerative FM becomes relevant not because Indonesia is unique, but because these tensions are visible at scale.

2. Physical Growth and Capability Growth

One of the central development challenges in fast-growing economies is synchronisation.

Capital can build physical assets quickly.

Human capability develops more slowly.

A facility can be completed in two years.

A competent engineering workforce may require many years of education, workplace experience, supervision, and certification.

This produces a potential mismatch:

physical capacity > human capability.

When that gap grows, organisations compensate through:

- imported expertise;
- expensive scarce talent;
- outsourcing;
- or concentrated dependency on a small group of specialists.

Those responses may be necessary.

But they do not always solve the underlying capability deficit.

A regenerative approach asks how each new development can also deepen the capability ecosystem around it.

3. FM and Indonesia's Green-Skills Transition

Indonesia's climate and development agenda increasingly requires workforce transition.

Bappenas work on green jobs has highlighted the importance of preparing workers with competencies relevant to a lower-carbon economy, while OECD and World Bank analysis similarly identifies skills and productivity as material components of Indonesia's longer-term transition.

The relevance to FM is direct.

Buildings do not decarbonise because organisations adopt targets.

They decarbonise through operational capability.

Someone must:

- optimise systems;
- interpret energy data;
- maintain efficient equipment;
- manage refrigerants;
- reduce resource waste;
- commission controls;
- integrate renewables;
- manage water;
- and understand lifecycle trade-offs.

This creates a major opportunity for FM.

The sector can become one of the principal mechanisms through which green skills reach the operational workforce.

4. TVET and the Facility Management Profession

FM has traditionally had less visible professional identity in Indonesia than some engineering or construction disciplines.

That creates a paradox.

Facilities are becoming more complex.

Yet the profession required to operate them can remain poorly understood.

TVET provides one bridge.

A structured FM capability ecosystem could integrate:

- entry-level vocational skills;
- technical specialisation;
- supervisory competence;
- professional certification;
- digital capability;
- sustainability;
- and leadership.

The objective is not to create another training programme.

It is to create a career architecture.

This distinction matters.

Training teaches a skill.

Career architecture gives the skill a future.

Without visible progression, frontline capability development may struggle to retain people.

5. The Social-Mobility Opportunity

FM is labour intensive.

That is often framed as a productivity challenge.

It can also be a social-mobility opportunity.

Large FM organisations employ substantial numbers of people in roles accessible to workers with varied educational backgrounds.

If these roles remain static, the sector can reproduce low mobility.

If they are connected to structured vocational development, they can become pathways.

A possible progression might be:

cleaning operative

→ team leader

→ supervisor

→ site manager

→ operations manager.

Or:

general technician

→ certified technician

→ senior technician

→ engineer

→ engineering manager.

The exact route varies.

The principle is more important:

frontline work can become a platform for capability accumulation.

That is regenerative because the worker exits each stage with greater capacity than when they entered.

6. Indonesia's Regional Diversity

Indonesia is not a single labour market.

Java, Sumatra, Kalimantan, Sulawesi, Bali, Papua, and other regions differ significantly in:

- economic structure;
- skills;
- infrastructure;
- industrial base;
- wage conditions;
- educational access;
- and community expectations.

A regenerative model cannot be deployed through uniform national assumptions.

A technical operating model appropriate for Greater Jakarta may not fit a remote industrial location.

A local-employment strategy suitable for Bali may not fit a specialist data-centre cluster.

This reinforces the principle of place-based design.

Global standards may define minimum performance.

Local systems determine how performance is achieved.

7. Urbanisation and Workplace Systems

Indonesia's urban growth increases demand for:

- commercial buildings;
- healthcare;
- logistics;
- data centres;
- manufacturing;
- education;
- retail;
- and infrastructure.

But urbanisation also increases system pressure:

- transport;
- water;
- energy;
- waste;
- housing;
- air quality;
- and labour mobility.

Facilities cannot be understood separately from city systems.

For example, a technically excellent workplace may still experience:

- poor attendance due to transport disruption;
- high turnover because of commuting burden;
- water shortages;
- flooding;
- or air-quality impacts.

This again demonstrates the limits of the property boundary.

8. Climate Exposure

Indonesia faces material climate exposure.

The exact risk differs by location.

Potential issues include:

- flooding;
- heat;
- sea-level change;
- water stress;
- extreme rainfall;
- landslide;
- and infrastructure disruption.

The implication for FM is not that every facility needs the same adaptation plan.

It is that climate assumptions used in design and operation should be periodically challenged.

A building designed for historical conditions may operate for decades into a different climate regime.

Regenerative FM requires forward-looking operating thresholds.

9. Indonesia's Industrial Expansion

Indonesia's industrial development creates a strong use case for regenerative systems.

New manufacturing, downstream processing, data centres, logistics, healthcare, and special economic zones create physical demand.

But every new asset also creates recurring demand for:

- technicians;
- security;
- cleaning;
- engineering;
- energy;
- water;
- suppliers;
- waste systems;
- and operational leadership.

A regenerative industrial strategy would view FM not as an afterthought following construction, but as part of the capability infrastructure required for investment to remain productive.

10. Responsible Outsourcing

Outsourcing is central to much of Facility Management.

Its design has social and operational significance.

A responsible outsourcing model should consider:

- legal compliance;
- employment conditions;
- safety;
- capability development;
- supervision;
- wage sustainability;
- workforce continuity;
- supplier financial health;
- and customer outcomes.

The key issue is not whether outsourcing is inherently positive or negative.

It is how the operating system distributes:

- risk;
- margin;
- responsibility;
- capability investment;
- and accountability.

An outsourcing model that structurally prevents workforce development cannot plausibly support regenerative outcomes.

11. The Community Dimension in Indonesia

Community relationships have particular relevance where facilities interact materially with local employment and economic systems.

Regenerative FM should distinguish between community engagement and community integration.

Engagement means communicating with communities.

Integration means designing material operating relationships.

Examples include:

- local recruitment;
- vocational partnerships;
- SME development;
- local supplier programmes;
- inclusive employment;
- and shared environmental initiatives.

The second is deeper because it changes how the operating system functions.

But it must remain competence based.

A local supplier that cannot meet safety, quality, or technical requirements should not be selected merely to satisfy a social metric.

The regenerative response is to determine whether capability can be developed.

That is more demanding than simply assigning a local-content target.

12. Community-Based Operating Models in Indonesia

Community has particular relevance in Indonesia because large developments frequently interact with local labour markets and social structures.

A community-first operating model should not mean automatic localisation of every role.

It should mean deliberate assessment of:

- which jobs can be filled locally;
- which skills can be developed;

- which suppliers can be strengthened;
- which specialist capabilities must remain external;
- and how knowledge transfer can progressively reduce unnecessary dependency.

This creates a practical balance between localisation and competence.

Competence should never be sacrificed merely to achieve a local percentage target.

The regenerative objective is to build local competence, not merely count local hires.

13. Inclusive Employment

Inclusive employment can expand FM's social role while simultaneously widening the available talent pool.

Potential groups include:

- people with disabilities;
- people who are neurodivergent;
- women entering traditionally male technical roles;
- young people without conventional academic pathways;
- workers transitioning from informal employment;
- and other groups facing labour-market barriers.

The operating principle should be:

design work so that capability can participate.

This may require:

- accessible facilities;
- job redesign;
- different recruitment processes;
- assistive technology;
- supervisor capability;
- and partnerships with specialist organisations.

Inclusion is partly a workplace-design question.

14. The Indonesia Regenerative FM Opportunity

The opportunity can be summarised as follows.

Indonesia does not merely need more facilities.

It needs facilities that increase the capability of the systems around them.

A new facility can consume local capability.

Or it can help create it.

It can increase environmental pressure.

Or it can reduce resource intensity and improve resilience.

It can import suppliers indefinitely.

Or it can help develop local ones.

It can create jobs. Or it can create careers.

This is the strategic distinction.

15. Exhibit 4 — Indonesia Regenerative FM System

NATIONAL DEVELOPMENT

Industrialisation • Urbanisation • Digitalisation • Green Transition

↓

WORKPLACE DEMAND

Factories • Data Centres • Healthcare • Offices • Logistics • SEZs

↓

SYSTEM REQUIREMENTS

People

Skills • Safety • Careers • Inclusion

Workplace

Reliability • Technology • Security • Productivity

Community

Employment • TVET • Supplier Development • Trust

Environment

Energy • Water • Carbon • Waste • Climate resilience

↓

FM OPERATING SYSTEM

Standards • Governance • Data • Technology • Partnerships

↓

OUTCOMES

- Productivity
- Workforce capability
- Social mobility

- Resource efficiency
- Operational resilience
- Investment confidence

↓

LONG-TERM CAPACITY

A stronger operating ecosystem for future growth

16. A Distinct Indonesia Contribution

The value of an Indonesian Regenerative FM model should not be measured by how closely it reproduces mature-market practice.

Its stronger contribution may be the opposite.

Indonesia can demonstrate how FM operates in a context where:

- workforce development;
- social mobility;
- rapid physical growth;
- environmental transition;
- and community capability

cannot be easily separated.

That may produce a version of Regenerative FM that is more explicitly social and developmental that model emerging from mature economies.

That is not a weakness.

It may be one of the framework's most important intellectual contributions.

The Indonesian lens asks:

Can workplace operations become part of national capability formation?

That question moves Facility Management beyond buildings without disconnecting it from business performance.

PART XII

IMPLEMENTATION

1. From Concept to Operating Model

The principal implementation risk for Regenerative FM is abstraction.

If the framework remains conceptual, organisations may agree with it while changing nothing.

Implementation needs a disciplined sequence.

The existing OCS delivery framework uses six stages:

Assess → Design → Implement → Operate → Measure → Regenerate.

This sequence remains appropriate.

For the white paper, it should be generalised beyond a single provider into an organisation-neutral methodology.

2. Stage One: Assess

The first stage is *diagnosis*.

The purpose is not immediately to identify projects.

It is to understand the system.

Assessment should cover:

- business objectives;
- critical operations;
- asset condition;
- workforce capability;
- stakeholders;
- community dependencies;
- environmental impacts and dependencies;
- technology;
- risk;
- data;
- contract structure;
- governance.

The core questions are:

- What must the workplace enable?
- What could prevent it?
- Which systems are currently strong?

- Which are fragile?
- Where are dependencies concentrated?
- What is becoming weaker?

3. Materiality Before Activity

One of the most important implementation principles is:

Do not begin with initiatives. Begin with materiality.

Otherwise, organisations can create long lists of attractive programmes with little strategic relevance.

Materiality can be assessed through:

- business impact;
- stakeholder impact;
- risk;
- scale;
- duration;
- reversibility;
- and degree of FM influence.

For example:

biodiversity may be highly material for a large land-intensive industrial estate but less so for a leased urban office.

Community employment may be strategically important at a remote site but less material for a small specialist office.

Asset resilience may dominate in a hospital.

Energy may dominate in a data centre.

The architecture remains common.

The priorities differ.

4. The Dependency-Influence Matrix

A useful diagnostic tool is to classify issues according to two variables:

How dependent is the organization on the system?

and

How much influence does FM have over it?

This produces four categories:

Dependency	FM influence	Strategic response
High	High	Direct manage and invest

Dependency	FM influence	Strategic response
High	Low	Monitor, partner, and build contingency
Low	High	Improve where justified by stakeholder or strategic value
Low	Low	Monitor proportionately

This prevents scope inflation.

For example, regional transport may be important to workforce attendance but largely outside an FM provider's direct control.

The appropriate response is not to "own" urban transport.

It may involve:

- monitoring;
- contingency planning;
- shift redesign;
- transport partnerships;
- or remote-work arrangements where appropriate.

This principle is simple:

Materiality determines attention; influence determines intervention.

5. Baseline Integrity

No regenerative claim is credible without a baseline.

The baseline should establish current conditions across the four systems.

Examples include:

People

- turnover;
- critical competencies;
- safety;
- training;
- career progression;
- absence.

Workplace

- asset health;
- uptime;
- maintenance backlog;
- service quality;
- workplace experience.

Community

- local employment;
- supplier concentration;
- vocational relationships;
- community issues.

Environment

- energy;
- carbon;
- water;
- waste;
- climate exposure.

Baseline need not be perfect.

But they must be sufficiently reliable to support comparison.

Where data quality is weak, this should be disclosed.

A useful principle is:

Uncertain data should reduce uncertain conclusions.

False precision damages credibility.

6. Stage Two: Design

The design stage translates diagnosis into an operating strategy.

This should specify:

- target outcomes;
- causal pathways;
- responsibilities;
- technology;
- data;
- procurement;
- governance;
- and measurement.

Each intervention should answer:

- Which system does it strengthen?
- What other systems does it affect?
- What trade-offs exist?
- What evidence supports the intervention?
- How will success be measured?
- Who owns the outcome?

7. Designing Causal Pathways

Every major intervention should have an explicit causal pathway.

For example:

Intervention: Technical apprenticeship programme.

Immediate output: More employees receiving structured technical/skill training.

Operational mechanism: Improved maintenance diagnosis and reduced dependency on scarce external specialists.

Expected operational outcome: Lower repeat failure and reduced vacancy exposure.

Longer-term capacity outcome: Greater internal capability to operate increasingly complex assets.

This is much stronger than reporting "100 technicians trained."

The number trained is an activity metric.

The regenerative proposition concerns what capability changed as a consequence.

8. Stage Three: Implement

Implementation should begin with the operating prerequisites.

These may include:

- data quality;
- baseline measurement;
- competency assessment;
- asset registers;
- supplier mapping;
- governance;
- digital infrastructure;
- or contract changes.

This is important because visible initiatives often fail when foundational systems are weak.

For example, predictive maintenance should not begin with AI if asset data are unreliable.

Community supplier development should not begin with procurement targets if quality requirements and capability gaps have not been mapped.

Measurement should not begin with dashboards if data ownership is unclear.

Regenerative FM follows a principle familiar to operational excellence:

stabilise before optimising.

9. Minimum Operating Foundation

Before an organization describes its approaches as regenerative, several minimum conditions should normally exist.

These includes:

- legal compliance;
- occupational health and safety;
- credible asset registers;
- basic maintenance discipline;
- workforce governance;
- documented responsibilities;
- reliable performance data;
- environmental compliance;
- ethical employment practices;
- and functioning escalation mechanisms.

The reason is important.

Regeneration cannot compensate for weak fundamentals.

A workplace with poor fire compliance cannot become regenerative through a community programme.

A workplace with uncontrolled maintenance backlog cannot compensate through ESG reporting.

A provider with unsafe employment practices cannot credibly claim social regeneration.

There is a hierarchy of legitimacy.

10. Stage Four: Operate

The operating phase embeds the framework into normal work.

This is where regeneration either becomes real or disappears.

Relevant mechanisms include:

- daily management;
- service reviews;
- maintenance planning;
- risk review;
- supplier management;
- workforce development;
- environmental monitoring;
- customer feedback;
- and improvement cycles.

Regeneration should not sit in a separate programme office.

It should alter how ordinary operating decisions are made.

11. Daily Management and Weak Signals

Routine FM management often focuses on exceptions:

- failures;
- complaints;
- backlogs;
- incidents;
- and missed SLAs.

Regenerative management should also track weak signals.

Examples include:

- increasing reactive-maintenance ratios;
- rising employee turnover;
- repeated environmental complaints;
- declining supplier responsiveness;
- or increasing energy consumption without obvious operational cause.

These may not represent failure.

They may represent deterioration.

The purpose of anticipatory FM is to intervene before the signal becomes the incident.

12. Stage Five: Measure

Measurement should examine all three levels:

Level 1: Operational performance

Is the service functioning?

Level 2: System Outcomes

Are People, Workplace, Community, and Environment outcomes improving?

Level 3: Regenerative Capacity

Is the underlying system becoming stronger?

The review should also ask:

- Did the intervention create unintended consequences?
- Did value shift between systems?
- Did risk move elsewhere?
- Did an apparent improvement result from external conditions?

and examine:

- unintended consequences;
- cost displacement;

- distribution of benefits;
- trade-offs;
- and data confidence.

A positive KPI movement is not automatically evidence of regeneration.

Measurement is partly validation and partly learning.

The mechanisms need to be understood.

13. Stage Six: Regenerate

The final stage is not a project closeout.

It is reinvestment.

Results should feed back into:

- capability;
- technology;
- assets;
- suppliers;
- workforce;
- and governance.

This is what makes the implementation cycle regenerative rather than merely continuous improvement.

Continuous improvement asks:

How do we perform the process better?

Regeneration additionally asks:

What should become more capable because we performed the process?

14. Continuous Improvement Versus Regeneration

The distinction can be expressed simply.

Continuous improvement asks:

How can this process perform better?

Regeneration asks:

How can performing this process also strengthen the system that makes future performance possible?

The difference is subtle but consequential.

A maintenance system that simultaneously:

- reduces failure;
- increases technician competence;

- extend asset life;
- reduces energy use;
- and creates reusable organizational knowledge

begins to demonstrate regenerative characteristics.

15. Governance Architecture

Regenerative FM requires cross-functional governance because no single function owns all four systems.

A practical model could include:

Board or executive sponsor

sets strategic intent and risk tolerance.

FM leadership

integrates workplace delivery.

Finance

validates investment and value.

HR

co-owns workforce capability.

Sustainability

co-owns environmental outcomes.

Procurement

aligns supplier incentives.

Technology

provides digital architecture and cyber governance.

Risk

integrates enterprise exposure.

Operations/business units

define mission-critical outcomes.

Community/external relations

supports material external relationships where relevant.

This governance structure should not create another committee for its own sake.

It should resolve decisions that cannot be solved within one function.

16. Decision Rights

Cross-functional models often fail because collaboration is encouraged but authority is unclear.

Regenerative FM should define:

- who recommends;
- who owns;
- who approves;
- who funds;
- who measures;
- who accepts trade-offs.

For example:

An energy optimisation initiative may technically belong to FM.

Capital approval may belong to finance.

Carbon benefit may sit with sustainability.

Operational disruption may require business-unit approval.

Technology integration may involve IT.

Without decision rights, integrated thinking produces integrated delay.

17. The Governance Principle of Subsidiarity

A useful governance principle is *subsidiarity*:

Decision should be taken at the lowest organizational level capable of making them effectively, while issues requiring broader authority should escalate.

Site teams should not need corporate approval for every improvement.

But site teams should also not independently make decisions that materially effect:

- enterprise risk;
- major capital;
- employment policy;
- cybersecurity;
- or corporate commitments.

This produces a balance between local responsiveness and enterprise governance.

18. Site, Portfolio and Enterprise Levels

Regenerative FM can operate at three levels:

Site

specific operations and local context.

Portfolio

standards, benchmarking, and shared capability.

Enterprise

strategy, capital, governance, and external commitments.

The mistake is to centralise everything or localise everything.

Some decisions benefit from scale.

Examples:

- technology platforms;
- training standards;
- supplier leverage;
- energy procurement;
- data architecture.

Others require local knowledge.

Examples:

- community engagement;
- climate exposure;
- labour-market conditions;
- site biodiversity;
- local suppliers.

The design principle is:

standardise what benefits from consistency; localise what depends upon place.

19. Procurement Architecture for Regenerative FM

Procurement is one of the strongest levers in the entire framework.

ISO 41012:2017 explicitly positions FM sourcing as a strategic process connected to core-business requirements and the development of facility-service agreements. A revised second edition was in the final draft stage in 2026, reinforcing the continuing relevance of strategic sourcing to FM.

Regenerative procurement should begin with the operating need rather than with a predetermined service structure.

The sequence should be:

Business need

↓

System requirements

↓

Outcome definition

↓

Sourcing model

↓

Commercial architecture

↓

Performance and capacity measures

This is preferable to starting with:

“How many cleaners, technicians, or guards do we need?”

A regenerative contract should ideally contain five layers.

Layer 1 — Baseline obligations

- Safety.
- Compliance.
- Reliability.
- Service quality.

Layer 2 — Efficiency

- Productivity.
- Resource efficiency.
- Cost management.

Layer 3 — Improvement

- Innovation.
- Continuous improvement.
- Asset performance.

Layer 4 — System outcomes

- Capability.
- Social value.
- Environmental outcomes.
- Resilience.

Layer 5 — Long-term capacity

Evidence that the workplace system is becoming stronger.

Not every contract needs all five layers.

But the architecture should prevent Layers 4 and 5 from being expected without commercial support.

20. Pricing Architecture Problem

Commercial structures influence behaviour.

Common pricing models include:

- cost-plus;
- fixed price;
- unit rates;
- management fee;
- output-based pricing;
- performance incentives;
- gain share;
- and hybrid models.

Each creates different incentives.

A fixed price contract may encourage productivity but also create underinvestment if price pressure is excessive.

Cost-plus may protect service quality but provide weaker efficiency incentives.

Output-based models can encourage innovation but require strong measurement.

Gain-sharing can support investment but demands credible baselines.

Regenerative FM does not prescribe a single pricing model.

The principle is:

commercial incentives should reinforce the desired operating behaviour.

21. Outcome-Based Contracting

Outcome-based contracting is frequently proposed as a solution to input-heavy FM models.

It can support Regenerative FM, but it also creates risks.

Benefits include:

- greater provider flexibility;
- innovation incentives;
- focus on results;
- reduced micromanagement.

Risks include:

- poorly defined outcomes;
- unfair risk transfer;

- measurement disputes;
- gaming;
- and underinvestment where outcomes are difficult to attribute.

A regenerative outcome model needs:

- clear baselines;
- shared data;
- credible causality;
- reasonable control boundaries;
- and balanced risk.

An FM provider should not be held solely accountable for an outcome that depends heavily on customer behaviour or capital decisions.

22. Control and Accountability

An important principle in outcome contracting is:

Accountability should broadly follow control.

A provider can reasonably be accountable for:

- maintenance quality;
- service processes;
- workforce management;
- specified environmental practices;
- and agreed operating actions.

It should not be solely accountable for outcomes dominated by:

- client capital decisions;
- occupant behaviour;
- utility-market conditions;
- or structural asset deficiencies outside its authority.

Shared outcomes often require shared accountability.

This is particularly important for:

- energy performance;
- employee experience;
- carbon reduction;
- asset lifecycle;
- and social value.

23. Contract Duration

Time horizon is another important design variable.

Many regenerative investments produce benefits slowly.

Examples include:

- workforce development;
- supplier development;
- digital integration;
- preventive maintenance;
- and community capability.

Short-term contracts can create a mismatch between investment period and benefit period.

The provider may bear the investment while the next supplier receives the benefit.

This can make underinvestment commercially rational.

Longer-term relationships are not automatically better.

They can reduce competitive tension.

The more appropriate principle is:

contract duration should be sufficient to support the investments expected from the operating model, while maintaining performance accountability.

24. Gainsharing and Reinvestment

One potential solution is to share value created through improvement.

For example:

- verified energy savings;
- reduced asset failure;
- or productivity gains
- can potentially support gain-sharing mechanisms.

A regenerative extension would allocate part of verified gains to reinvestment.

The sequence becomes:

improvement

↓

measurable value

↓

shared benefit

↓

partial reinvestment

↓

greater future capability.

This converts savings into a reinforcing loop rather than simply extracting them from the system.

25. Supplier Development

Supplier management often focuses on performance assurance.

Regenerative supplier management additionally asks whether critical suppliers are becoming more capable.

This can include:

- technical development;
- quality systems;
- safety;
- digital integration;
- ESG capability;
- financial resilience;
- and succession planning.

The objective is not to protect poor suppliers indefinitely.

It is to determine whether strategically important capability can be developed.

Supplier development is particularly relevant where:

- local ecosystems are immature;
- specialist capabilities are scarce;
- or supply-chain concentration is high.

26. Procurement and Social Value

Social procurement can support:

- local employment;
- SME participation;
- inclusive suppliers;
- apprenticeships;
- and community capability.

But targets require discipline.

A requirement such as:

“30% local spend” may increase local purchasing.

It does not necessarily increase local capability.

A stronger metric might ask:

- How many suppliers progressed from basic to qualified status?
- How many increased technical capabilities?
- How many moved into higher-value scopes?
- How many became independently competitive?

The difference is significant.

Spend measures economic transfer.

Development measures capacity formation.

27. Digital Enablement

Digitalisation is one of the principal enablers of Regenerative FM.

Relevant technologies include:

- CMMS;
- CAFM;
- IWMS;
- BMS;
- IoT sensors;
- digital twins;
- mobile workforce platforms;
- analytics;
- AI;
- remote monitoring;
- and ESG data systems.

But technology should enter after the decision architecture has been defined.

The central question is not:

What technology is available?

It is:

Which decisions need to become faster, more accurate or more anticipatory?

Technology then serves the decision.

28. Data Architecture

Data are foundational.

A credible regenerative operating model requires traceable data across:

- assets;
- people;
- energy;

- water;
- waste;
- suppliers;
- risk;
- experience;
- and performance.

But not every metric needs to be integrated into one platform.

The better principle is:

integrate decisions before integrating databases.

The organisation should first determine:

- which decisions require information;
- what information is material;
- who owns it;
- what frequency is required;
- and what threshold triggers action.

Technology design follows.

29. Digital Twins and Regenerative FM

Digital twins can play a particularly useful role where assets are complex.

Potential regenerative applications include:

- asset health;
- scenario testing;
- energy optimisation;
- maintenance planning;
- lifecycle analysis;
- and resilience modelling.

But a digital twin should not be treated as a digital replica for its own sake.

Its value comes from decision improvement.

The same criterion applies to every technology:

Does it strengthen sensing, understanding, decision-making, action, or learning?

If not, it may be digital sophistication without systemic value.

30. Artificial Intelligence Governance

AI adds further requirements.

A regenerative AI implementation should evaluate:

- data provenance;
- model reliability;
- human oversight;
- privacy;
- security;
- bias;
- skills;
- and accountability.
- The purpose should be augmentation.

For example:

AI may identify maintenance anomalies.

A competent engineer should still interpret the operating context.

AI may optimise scheduling.

Managers must still account for human factors.

AI may predict staffing requirements.

HR and operations remain responsible for employment decisions.

Regenerative FM rejects technological determinism.

Human and machine capability should evolve together.

31. Human-AI Complementarity

AI can increase FM capability in areas such as:

- predictive maintenance;
- fault detection;
- energy optimization;
- resource planning;
- occupancy analysis;
- workflow automation;
- risk sensing;
- and knowledge retrieval.

Its value lies primarily in pattern recognition, prediction, and decision support.

However, AI introduces risks.

These include:

- poor data provenance;
- bias;

- cybersecurity;
- privacy;
- automation dependency;
- and erosion of human judgement.

The appropriate principle is:

AI should augment organizational intelligence, not substitute for organizational accountability.

32. Capability Architecture

Regenerative FM requires competencies that traditional FM development may not cover sufficiently.

Future FM leaders may need competence across:

- engineering;
- workplace experience;
- sustainability;
- data;
- risk;
- commercial management;
- systems thinking;
- social value;
- stakeholder management;
- and workforce development.

No individual will master all domains.

The requirement is integrative leadership.

The FM leader's value increasingly lies in understanding relationships across specialists rather than being the deepest specialist in every discipline.

33. Capability Implications of AI

AI adoption creates new workforce requirements.

These include:

- data literacy;
- critical interpretation;
- prompting and query formulation;
- model limitations;
- cyber awareness;
- and domain judgement.

This reinforces one of the paper’s central propositions:

Technology does not eliminate capability requirements. It redistributes them.

A regenerative AI strategy should include workforce development from the beginning.

34. Asset Management Alignment

Regenerative FM also intersects directly with asset-management principles.

ISO 55001:2024 provides the current international management-system framework for asset management, with emphasis on systematic management of assets in alignment with organisational objectives. The earlier 2014 edition similarly emphasised balancing performance, risk, and expenditure across the asset lifecycle.

Regenerative FM should not duplicate asset management.

Instead, it adds a wider system lens.

Asset management asks:

How should physical assets be managed across their lifecycle?

Regenerative FM additionally asks:

What people, suppliers, information, and environmental conditions are required for those assets to remain effective over time?

The two should be complementary.

35. Capital Planning

Capital expenditure is often where long-term FM capability is either strengthened or constrained.

Regenerative capital planning should consider:

- condition;
- criticality;
- energy;
- carbon;
- maintenance;
- resilience;
- adaptability;
- user experience;
- and lifecycle cost.

A replacement decision should not be based exclusively on age.

Nor should it be based exclusively on energy efficiency.

A comprehensive decision may ask:

What is the remaining useful life?

How frequently does the asset fail?

What future business requirement must it meet?

What skills are needed to operate the replacement?

Are parts available?

How vulnerable is the system to climate or energy changes?

What environmental impact results from replacement?

This is a system decision.

36. Design for Maintainability

Many operating problems originate before FM receives the asset.

Poor access.

Inconsistent equipment.

Inadequate plant space.

Complex proprietary systems.

Limited sensor access.

Inappropriate materials.

Insufficient maintenance provisions.

Regenerative FM should influence design upstream.

This reinforces the importance of lifecycle involvement.

FM input during design can improve:

- maintainability;
- energy performance;
- safety;
- operability;
- and lifecycle value.

The future FM organisation should not merely inherit buildings.

Where possible, it should help shape them.

37. Behaviour and Organisational Outcomes

Facility performance also depends upon organisational behaviour.

ISO 41015:2023 explicitly addresses influencing organisational behaviours for improved facility outcomes, reflecting the fact that FM results are affected not only by assets and procedures but by how organisations behave.

This aligns strongly with Regenerative FM.

Energy performance, for example, depends partly upon:

- occupant behaviour;
- management decisions;
- maintenance;
- controls;
- and organisational priorities.

Waste performance depends partly upon:

- procurement;
- users;
- suppliers;
- and operating discipline.

The system includes behavioural architecture.

38. Implementation Roadmap

A practical roadmap can be structured over four horizons.

Horizon 1 — Stabilise

0–12 months.

- Compliance.
- Asset baseline.
- Workforce baseline.
- Critical risks.
- Data quality.

Horizon 2 — Integrate

12–24 months.

- Cross-functional governance.
- Integrated KPIs.
- Technology.
- Supplier alignment.
- Capability planning.

Horizon 3 — Anticipate

24–36 months.

- Predictive analytics.
- scenario planning.
- skills forecasting.
- climate adaptation.

- supply resilience.

Horizon 4 — Regenerate

36 months onward.

- system-capacity measurement;
- local capability ecosystems;
- circular models;
- continuous reinvestment;
- portfolio learning.

The timings are illustrative.

Maturity, not calendar duration, should determine progression.

39. Exhibit 5 — Regenerative FM Implementation Architecture

1. ASSESS

- Purpose
- Dependencies
- Risks
- Capability
- Materiality

↓

2. DESIGN

- Outcomes
- Causal pathways
- Governance
- Commercial model
- Measures

↓

3. IMPLEMENT

- People
- Assets
- Technology
- Suppliers
- Data

↓

4. OPERATE

- Deliver

- Sense
- Escalate
- Coordinate
- Improve

↓

5. MEASURE

- Operational performance
- System outcomes
- Capacity trajectory

↓

6. REGENERATE

- Learn
- Redesign
- Reinvest
- Strengthen

↺

The final arrow returns to assessment.

A regenerative system is never considered finished.

40. The Implementation Test

A useful final implementation test is to ask five questions.

1. Are operations reliable today?

If not, stabilise.

2. Are the four systems being managed as connected dependencies?

If not, integrate.

3. Can the organisation identify emerging weaknesses before failure?

If not, develop anticipatory capability.

4. Are improvements strengthening future capability or merely improving today's metric?

If only today's metric improves, the approach remains primarily continuous improvement.

5. Can the organisation demonstrate the effect with credible evidence?

If not, the claim should remain provisional.

These five questions provide a practical test for whether Regenerative FM has moved from aspiration into an operating model.

PART XIII
LIMITATIONS AND CRITICAL QUESTIONS

1. Why the Framework Must Be Challenged

A framework becomes dangerous when its vocabulary expands faster than its evidence.

“Regenerative” carries this risk.

The term is attractive.

It can easily be applied to activities that are merely efficient, sustainable, or socially responsible.

This white paper needs to define the framework's limitations explicitly.

2. Measurement Risk

The first limitation is measurement.

How do we know a system has become regenerative rather than merely better?

This is difficult.

An improvement in employee retention may be positive but not necessarily regenerative.

An energy reduction may be beneficial but not regenerative.

A community programme may create value but not change system capacity.

The strongest interpretation requires evidence of:

- improved condition;
- increased capacity;
- and a plausible reinforcing relationship over time.

This creates a higher evidentiary threshold than conventional ESG reporting.

3. Attribution Risk

FM rarely controls all relevant variables.

A workplace outcome may depend upon:

- HR;
- capital investment;
- IT;
- procurement;
- operations;
- leadership;

- or external conditions.

Regenerative FM should avoid claiming sole causation.

Its legitimate claim is often contribution.

This is intellectually less dramatic but more credible.

4. Boundary Risk

If Regenerative FM includes:

- people;
- community;
- environment;
- technology;
- risk;
- procurement;
- and organisational performance,
- does it become so broad that it ceases to be Facility Management?

This is a legitimate criticism.

The boundary should be governed by material workplace dependency and influence.

Regenerative FM does not own education policy.

But it may partner with vocational institutions where skills materially affect workplace capability.

It does not own community development.

But it should understand community conditions that materially affect operations.

It does not own climate policy.

But it does own many operational responses to climate risk.

The framework expands FM's systems awareness without claiming unlimited organisational jurisdiction.

5. Greenwashing and Regeneration-Washing

Regeneration can become a reputational label detached from evidence.

This creates a risk more serious than ordinary overstatement because “regenerative” implies positive system contribution.

A basic principle should apply:

Do not call an intervention regenerative unless there is credible evidence that it strengthens relevant system capacity beyond maintaining performance or reducing harm.

Examples:

5% lower electricity use = efficiency improvement.

Reduced carbon emissions = sustainability improvement.

Restored ecological function around a site = potentially regenerative environmental outcome.

Training 100 workers = activity.

Demonstrably increased long-term employability and technical capability = potentially regenerative people outcome.

Terminology should follow evidence.

6. Trade-Off Risk

System improvements can conflict.

A resilience intervention can increase material use.

A local procurement requirement can increase cost.

Automation can improve productivity while reducing some jobs.

Water-saving measures can have hygiene consequences if badly designed.

High-performance filters can increase fan energy.

Regenerative FM does not remove trade-offs.

It makes them more visible.

The relevant governance principle is:

optimise the system, not each metric independently.

7. Equity Risk

Not everyone benefits equally from workplace transformation.

For example:

- automation may benefit customers and shareholders while displacing some workers.
- urban improvement may increase property value while making communities less affordable.
- environmental regulation can create costs disproportionately affecting smaller suppliers.

A regenerative framework should ask:

Who gains?

- Who pays?
- Who carries risk?
- Who has voice?

This adds distributive justice to the system analysis.

8. Commercial Feasibility

Some regenerative interventions will not be economically feasible.

That should be acknowledged.

The framework is not an argument that every desirable outcome must be funded.

Organisations face capital constraints.

Customers have budgets.

Investments compete.

The discipline is prioritisation.

Regenerative FM should improve decision quality, not suspend economic reality.

9. Time-Horizon Risk

Regeneration often requires longer time horizons than commercial contracts or executive tenures.

This creates governance risk.

Benefits can become vulnerable to:

- leadership change;
- budget cycles;
- contract renewal;
- or strategic reprioritisation.

One response is to embed regenerative objectives into formal systems:

- procurement;
- standards;
- capital planning;
- competency frameworks;
- and KPIs.

Institutionalisation matters more than individual enthusiasm.

10. Cultural Transfer Risk

Regenerative approaches developed in Europe, North America or Australia should not automatically be transplanted into Indonesia.

The social, regulatory, and economic context differs.

The same applies in reverse.

An Indonesian model may not transfer directly elsewhere.

This again reinforces place-based application.

Universal principles can coexist with local operating models.

PART XIV

RESEARCH AGENDA

1. From Conceptual Framework to Testable Model

The strongest future for Regenerative FM would not be widespread adoption of the terminology.

It would be empirical testing.

A useful framework should generate hypotheses that can be disproven.

The next stage requires research.

2. Core Research Questions

The following research questions emerge directly from the model.

RQ1

Does higher integration among People, Workplace, Community and Environment correlate with stronger operational resilience?

RQ2

Does workforce capability mediate the relationship between FM practices and asset reliability?

RQ3

Does community integration contribute measurably to workforce stability and supplier resilience?

RQ4

Do anticipatory FM operating models reduce disruption frequency or cost compared with predominantly reactive models?

RQ5

Does regenerative workplace maturity predict future operational performance?

RQ6

What relationship exists between RWRI maturity and established indicators such as:

- uptime;
- turnover;
- safety;
- energy intensity;
- customer satisfaction;
- and business continuity?

RQ7

Which cross-system relationships are strongest?

For example:

People → Workplace?

Workplace → Environment?

Community → People?

RQ8

Does the strength of these relationships vary by sector?

RQ9

How should trade-offs between systems be weighted?

RQ10

What outcomes can legitimately be attributed to FM rather than merely associated with it?

3. Hypotheses for Empirical Testing

Potential hypotheses include:

H1: Higher workforce capability is positively associated with asset reliability.

H2: Higher employee retention is positively associated with service consistency.

H3: Greater preventive and predictive maintenance maturity is associated with lower energy waste.

H4: Stronger local capability pipelines are associated with lower critical-role vacancy duration.

H5: Higher cross-functional information flow is associated with shorter decision latency.

H6: Higher RWRI maturity is associated with stronger business-continuity performance.

H7: The relationship between regenerative maturity and operational performance is mediated by integration quality.

These should initially be treated as testable propositions, not conclusions.

4. Research Design

A serious validation programme could combine:

Cross-sectional study

Multiple sites and sectors assessed at one point in time.

Purpose:

test relationships between maturity and outcomes.

Longitudinal study

Sites assessed repeatedly over several years.

Purpose:

test whether changes in regenerative maturity precede changes in performance.

Case studies

Deep examination of selected workplaces.

Purpose:

understand causal pathways.

Comparative studies

Compare:

- high versus low maturity;
- Indonesia versus other markets;
- different sectors;
- different procurement models.

Qualitative interviews

- Executives;
- FM leaders;
- frontline employees;
- customers;
- community partners;
- suppliers.

Purpose:

understand mechanisms not visible in quantitative data.

5. Validation of the RWRI™

RWRI validation should proceed in stages.

Stage 1: Construct validity

Are the four dimensions conceptually distinct and defensible?

Stage 2: Content validity

Do subject-matter experts agree the indicators appropriately represent the constructs?

Stage 3: Reliability

Do different assessors reach similar scores?

Stage 4: Criterion validity

Do scores relate to recognised performance measures?

Stage 5: Predictive validity

Can higher maturity predict future outcomes?

Stage 6: Cross-sector validity

Does the model work similarly across sectors?

Stage 7: Cross-cultural validity

Does it remain valid across geographies?

Until these steps occur, claims should remain proportionate.

6. A Practitioner Research Network

Validation should ideally extend beyond one organisation.

A multi-institutional research network could involve:

- FM providers;
- clients;
- universities;
- professional bodies;
- government;
- vocational institutions;
- and sustainability organisations.

This would reduce the risk that the framework becomes proprietary advocacy.

Independent challenge would improve it.

Possible outcomes include:

- sector benchmarks;
- open research;
- case studies;
- doctoral research;
- and eventual peer-reviewed publication.

PART XV
CONCLUSION

1. From Maintaining Facilities to Strengthening Systems

Facility Management has always been about continuity.

Buildings must work.

People must be safe.

Assets must perform.

Services must be delivered.

Those responsibilities remain fundamental.

But the conditions determining whether a workplace can continue to perform are becoming more interconnected.

People depend upon communities.

Assets depend upon skills.

Technology depends upon data and judgement.

Businesses depend upon energy, water, and resources.

Communities depend partly upon employment and economic activity.

Environmental change influences every layer.

A workplace cannot be understood fully as a collection of independent services.

It is an operating ecosystem.

That does not mean everything becomes Facility Management.

It means Facility Management needs to understand the wider systems upon which its outcomes depend.

2. The Central Proposition

This paper has proposed that Facility Management can evolve through three broad operating logics.

Traditional FM

maintains assets and services.

Sustainable FM

reduces harmful impacts and improves resource performance.

Regenerative FM

asks whether workplace operations can additionally strengthen the capacity of the human, physical, social, and natural systems upon which future performance depends.

The third does not replace the first two.

It incorporates them.

A workplace cannot regenerate effectively if it is unsafe.

It cannot regenerate if assets are unreliable.

It cannot regenerate if sustainability fundamentals are ignored.

Operational excellence remains the foundation.

3. Why the Four Systems Matter

The four systems proposed in this paper are:

- People
- Workplace
- Community
- Environment

Their importance lies not in the categories themselves but in their interactions.

Workforce capability influences asset performance.

Asset performance influences energy efficiency.

Community capability influences workforce resilience (Hall et al, 2023).

Environmental conditions influence operations and people.

The system behaves through feedback.

Regenerative FM attempts to manage relationships rather than maximise isolated metrics.

4. The Role of Anticipation

A second defining principle is anticipation.

Reactive FM asks:

What failed?

Preventive FM asks:

How can failure be prevented?

Predictive FM asks:

What is likely to fail?

Regenerative FM ultimately asks:

What underlying capacity must become stronger so that the workplace is better prepared for what comes next?

That question changes the time horizon.

It moves attention from incident management toward system development.

5. The Role of People

No version of Regenerative FM is credible without workforce development.

Technology will continue to advance.

AI will increasingly support FM decisions.

Buildings will become more instrumented.

But technology does not eliminate the need for capability.

It changes it.

The future FM workforce will need to combine:

- technical competence;
- digital fluency;
- systems thinking;
- environmental knowledge;
- risk awareness;
- and human judgement.

Developing those capabilities is not peripheral to regeneration.

It is one of its principal mechanisms.

6. The Role of Community

Community is perhaps the most significant extension of the traditional FM boundary.

Its inclusion should not be interpreted as an attempt to turn FM into CSR.

The argument is operational.

Workplaces depend upon:

- labour markets;
- education;
- suppliers;
- transport;
- social stability;
- and stakeholder trust.

Those conditions emerge beyond the property boundary.

A workplace that systematically weakens the social ecosystem around it may eventually weaken itself.

A workplace that helps strengthen relevant local capability may increase its own resilience.

This relationship deserves far more empirical investigation.

7. The Role of Environment

The natural environment similarly cannot be treated solely as an external impact category.

Workplaces depend upon:

- energy;
- water;
- materials;
- climate;
- and ecological systems.

Resource efficiency serves both sustainability and resilience.

Climate adaptation becomes a workplace issue.

Circularity becomes an asset-management issue.

Nature dependency becomes a strategic issue where material.

Regenerative FM integrates these rather than assigning them exclusively to a sustainability function.

8. The Role of Procurement

One of the strongest practical conclusions of this paper is that procurement architecture matters.

A customer cannot reasonably demand:

- innovation;
- capability development;
- social value;
- environmental improvement;
- resilience;
- and long-term investment

while designing a commercial model that rewards only short-term price reduction.

Procurement determines whether regenerative behaviour is economically rational.

That is why contract design should be treated as part of the operating system.

9. The Role of Measurement

Regenerative FM also raises the evidentiary threshold.

The term should not be used because an activity sounds progressive.

It should be supported by evidence.

The paper proposes three levels of measurement:

- operational performance;
- system outcomes;
- regenerative capacity.

The third is the distinguishing test.

Is the system becoming more capable?

That question should eventually determine whether the model has genuine value.

10. Indonesia's Opportunity

Indonesia has a particular opportunity to test this proposition.

The country is building rapidly.

Its economy is becoming more technologically complex.

Its green transition will require new capability.

Its industrial growth will create substantial workplace demand.

Its social and geographic diversity requires localisation.

The question is not only how many new facilities Indonesia will build.

It is:

- What capabilities will those facilities leave behind?
- Do they deepen the workforce?
- Do they create stronger supplier ecosystems?
- Do they increase resource efficiency?
- Do they improve resilience?
- Do they create pathways for mobility?
- Do they strengthen the communities around them?

That is the regenerative question at national scale.

11. Final Proposition

Facility Management has traditionally been evaluated by what it keeps working.

The next stage of the profession may also be evaluated by what it makes stronger.

A building that remains functional is maintained.

A building that consumes fewer resources is more sustainable.

A workplace that increases the future capability of its people, assets, communities, and environmental systems begins to become regenerative.

That is a higher threshold.

It should be.

Regeneration should not be easy to claim.

It should be difficult to prove.

That difficulty is what gives the concept value.

The future of Facility Management may be defined less by how efficiently we maintain places, and more by whether the systems surrounding those places become stronger because of how we manage them.

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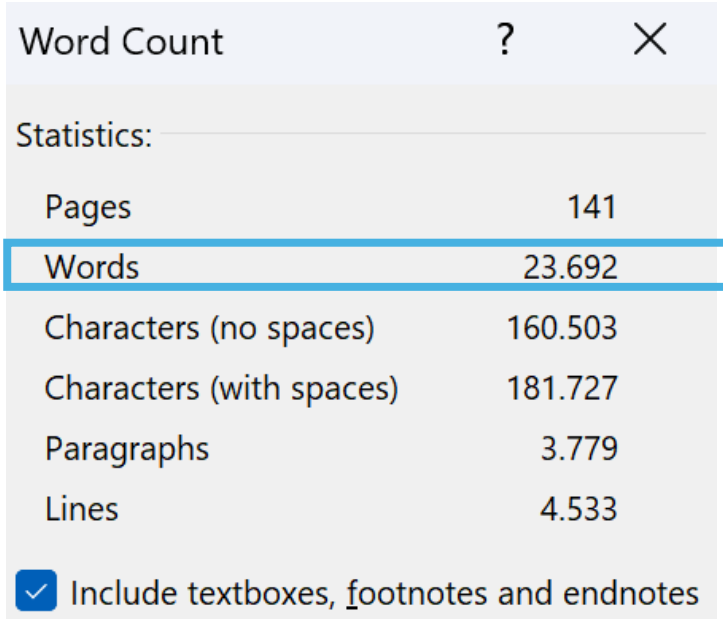
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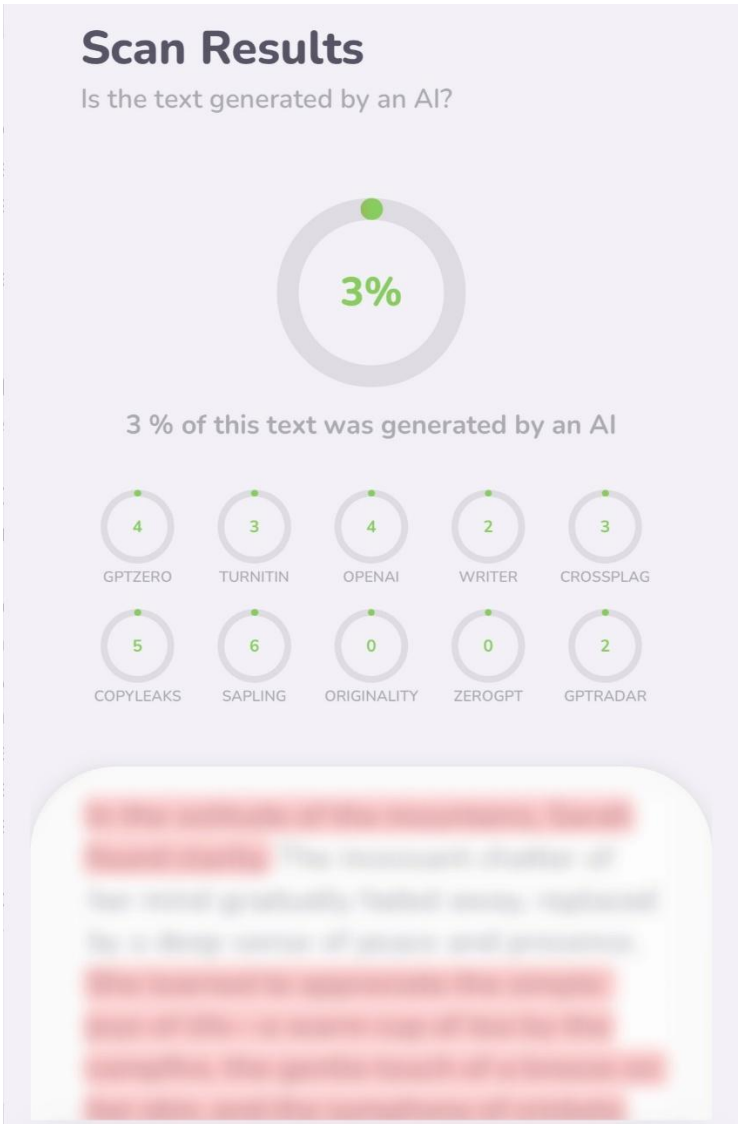
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Author Profiles:

Yohanes Jeffry Johary

Yohanes Jeffry Johary leads OCS Indonesia, over 11,770 employees across 771 work locations, within a global organization shaped by more than 126 years of heritage. His work focuses on delivering performance while continuously redesigning how organizations remain relevant in complex and evolving environments.

Over the past 19+ years, Jeffry has built his career around a central question: how to translate strategy into consistent execution. His approach has evolved into designing integrated systems by aligning customer experience, digitalization, and ESG into operating models that sustain long-term value.

He holds a Master of Science (MSc) in Business Psychology from the University of East London, graduating with distinction. His dissertation, "*Designing Flow-Driven Workplaces Through Integrated People Practices: A Strategic Research to Sustain Optimal Productivity in Facility Management*," introduced the concepts of "*flow-by-design*" and "*flow-compatible functioning*," reframing performance as a function of organizational design rather than individual capability.

He is also a graduate of the Alchemist 4.0 Program from the Graduate School of Business - University of Cape Town and Graduate Certificate on Organization Resilience, Risk, and High Reliability programme from the Institute of Presilience® (Australia). Jeffry concluded the Social Enterprise program at Harvard Business School Executive Education in collaboration with the Hauser Institute for Civil Society at Harvard Kennedy School.

His leadership combines analytical clarity with systems thinking, enabling him to navigate complexity while maintaining execution discipline. He views intelligence not as an individual trait, but as an organizational outcome shaped by how decisions, information, and trust flow across the system.

This philosophy is most visible in how OCS Indonesia operates. While commercially disciplined in its business model, the organization is built with the mindset of a social enterprise by embedding workforce development, social mobility, & responsible employment practices into its core operations.

Beyond his corporate role, Jeffry contributes through British Chamber of Commerce (BritCham Indonesia) and American Chamber of Commerce (AmCham Indonesia) Indonesia to advancing governance and sustainability. He is the President of the Indonesia Chapter of IFMA and ASEAN President of The Institute of Strategic Risk Management (ISRM).

His work is guided by a simple principle: organizations do not underperform because people lack capability, but because systems are misaligned. Leadership, therefore, is about designing environments where the right behaviours can emerge consistently at scale.

Andi Saputra is a senior executive with more than two decades of experience in finance, strategy, transformation, and business leadership within leading global Facility Management organisations. He currently serves as Chief Finance & Strategy Officer of OCS Indonesia, where he works at the intersection of financial performance, commercial growth, operational excellence, and long-term value creation.

Throughout his career, Andi has held senior leadership roles within leading global Facility Management organisations, including ISS, G4S, and OCS, gaining experience across finance transformation, business performance, governance, commercial management, and organisational effectiveness. This journey has given him a broad perspective on how global FM organisations evolve, scale, and create sustainable value for customers, employees, and stakeholders.

His career has been shaped by a central question: how can Finance move beyond reporting performance to actively shape better business decisions and stronger execution? His approach combines financial discipline, commercial thinking, strategic planning, digital transformation, and operational insight to translate strategy into measurable and sustainable outcomes.

Across his experience in global FM environments, Andi has worked across both country and international settings, contributing to finance transformation, performance management, governance, and business partnering. These experiences have shaped his belief that financial performance cannot be separated from operational reality. In Facility Management, value is created through the alignment of people, processes, technology, customer experience, and financial discipline.

Andi holds an MBA from Calwest University and is an ACCA (Association of Chartered Certified Accountants)-qualified professional. He is also a Certified Management Accountant (CMA) from the Institute of Certified Management Accountants (ICMA), Australia, and has completed ACCA professional learning in Sustainable Finance and Climate Change, reflecting his commitment to integrating financial performance, sustainability, and long-term business resilience.

Andi is passionate about the future of Facility Management and the role of digitalisation, data, sustainability, and regenerative approaches in reshaping the industry. He believes Indonesian FM has significant potential to evolve from a predominantly service-delivery industry into a more strategic, technology-enabled, data-driven, and value-creating profession. His ambition is to contribute to advancing the FM industry in Indonesia toward the standards of more sophisticated sectors, where Facility Management is recognised not merely as an operational support function, but as a strategic contributor to business performance, resilience, innovation, sustainability, and enterprise value.