



Redefining business sustainability maturity model for micro, small, medium enterprises

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ABSTRACT

Sustainability maturity models developed for large corporations have limited applicability to Micro, Small, and Medium Enterprises due to implicit indicators and contextual misalignment. This conceptual study developed a Business Sustainability Maturity Model for Indonesian MSMEs through five prototyping stages: literature selection, narrative analysis, accounting overlay mapping, disclosure standard alignment, and digital deployment. The resulting model comprises nine value activities and 26 indicators, each described across five maturity levels, with 10 indicators supplemented by SAK EMKM-based accounting practices and 5 indicators aligned with the national sustainability disclosure standard PSPK-1. A 39-item self-assessment questionnaire was embedded into a web platform delivering instant maturity scores, visualisations, and improvement recommendations. Expert judgment involving 21 specialists, pilot testing with 255 MSME respondents across ten Indonesian provinces, and system testing collectively indicated that the model is relevant, feasible, and usable; detailed validation results are reported in a companion paper. The novelty lies in simultaneously integrating accounting-based measurement, disclosure-standard alignment, and digital operationalisation into a single MSME-oriented sustainability maturity instrument. Theoretically, the study advances maturity model literature by grounding progression levels in Stakeholder Theory, reframing sustainability maturity as the progressive broadening of stakeholder accountability. Practically, the model supports MSME operators, regulators, and supply-chain partners through standardised assessment.

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1. INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) constitute the backbone of the Indonesian economy, with more than 64 million operating units contributing in excess of 61% to Gross Domestic Product (International Monetary Fund, 2024). Although MSMEs are widely expected to serve as catalysts of sustainable development, their internal realities are shaped by limited resources, restricted access to capital, and modest managerial capacity. Embedding the three pillars of sustainability: economic, social, and environmental, is therefore frequently perceived as an additional cost burden rather than

as a strategic investment capable of enhancing efficiency, fostering innovation, and generating long-term value (Alayón et al., 2022; van der Poll, 2022).

A fundamental impediment lies in the low level of financial literacy and the lack of standardised accounting practices among MSME operators (Edwy et al., 2023; Risman, 2024). Many continue to commingle personal funds with business capital and have yet to adopt the Financial Accounting Standard for Micro, Small, and Medium Entities (SAK EMKM) (Meidawati & Oktari, 2022; Zulfikar et al., 2022). Without a robust accounting foundation, any claim regarding environmentally responsible practices or social accountability becomes difficult to verify and ultimately loses credibility before external stakeholders (O'Reilly et al., 2024). Stakeholder Theory (Freeman, 1984) offers a foundational explanation for this dynamic: organisations create long-term value not by serving shareholders alone, but by identifying, understanding, and responding to the legitimate expectations of all parties who affect or are affected by their operations, including employees, customers, creditors, regulators, and the wider community. For MSMEs, the inability to demonstrate sustainability through verifiable accounting practices therefore represents a failure to meet the accountability expectations of precisely these stakeholders (Freeman et al., 2010).

The maturity model construct has long been deployed as a diagnostic device that enables organisations to ascertain their present position and chart a trajectory of improvement (Becker et al., 2009; Piwovar-Sulej et al., 2022). In the context of business sustainability, among the comprehensive frameworks available, Cagnin's (2005) Business Sustainability Maturity Model (BSMM) stands out (Cagnin et al., 2005). Nevertheless, that framework was conceived for large corporations, with indicators that remain narrative and qualitative in character and are consequently difficult to operationalise within MSME settings. This difficulty is not incidental but structural: narrative-based maturity descriptors presuppose the existence of dedicated organisational functions sustainability committees, formal reporting hierarchies, and specialised personnel through which progression can be observed and assessed, structures that are largely absent in owner-managed MSMEs where strategic and operational roles are fused in a single individual (Caputo et al., 2024). Furthermore, such models calibrate their indicators to the stakeholder salience patterns of large corporations, in which institutional investors, civil-society organisations, and regulatory bodies exert sustained pressure; MSMEs, by contrast, face a narrower and more transactional stakeholder set (Jones et al., 2020), rendering corporate-oriented indicators only partially relevant. Finally, the absence of any linkage to accounting records means that even where an MSME satisfies a narrative descriptor, the claim cannot be independently substantiated, undermining the diagnostic credibility of the assessment.

From a Stakeholder Theory perspective, the five-level maturity structure reflects the progressive broadening of an organisation's stakeholder orientation. Stakeholder salience theory (Mitchell et al., 1997) clarifies the mechanism underlying this progression: stakeholders are prioritised according to three attributes power (the capacity to impose their will), legitimacy (the validity of their claim), and urgency (the time-sensitivity of their claim) and organisations at low maturity attend disproportionately to stakeholders possessing coercive power, such as creditors and tax authorities, while organisations at high maturity extend recognition to stakeholders whose claims rest on legitimacy or urgency alone, such as community groups and environmental advocates, even absent formal power to sanction non-compliance. Sustainable organisational performance depends on the systematic management of relationships with stakeholders whose support (financial, reputational, regulatory, or social) is necessary for long-term viability (Freeman, 1984; Freeman et al., 2010). At lower maturity levels, MSMEs respond reactively to the demands of only the most salient stakeholders, principally creditors and tax authorities. As maturity advances, the organisation's stakeholder horizon expands to encompass employees, customers, suppliers, and the community, until sustainability is fully embedded in strategy and stakeholders are engaged as partners in value creation. This progression, from narrow compliance to broad co-creation, constitutes the theoretical mechanism underpinning the five-level architecture of the proposed BSMM, which is designed to facilitate it through explicit, measurable indicators.

Yet existing maturity models, including Cagnin's (2005), were not designed with Stakeholder Theory as an explicit grounding; their maturity descriptors track an undifferentiated notion of organisational capability rather than the shifting power, legitimacy, and urgency attributes of the stakeholders an organisation must answer to. Nor were these models calibrated for the stakeholder landscape and resource constraints of small enterprises, where the fusion of ownership and management, the absence of formal sustainability functions, and the predominance of power-based over legitimacy- or urgency-based stakeholder claims fundamentally alter what a meaningful progression in maturity should look like. This constitutes the theoretical gap this study seeks to address. A research gap also persists: extant models do not incorporate accounting measurement consistent with the Indonesian context (Agustina & Augustine, 2024), and the linkage between sustainability value activities and PSPK-1 remains underexplored. Practically, MSME operators lack access to a sustainability assessment instrument that is simultaneously standards-aligned, financially grounded, and digitally accessible without intensive facilitation. The present study addresses these three gaps by developing a BSMM that is theoretically grounded, accounting-based, disclosure-aligned, and digitally operationalised, the details of which are elaborated in the sections that follow.

The present study aims to develop a BSMM dedicated to MSMEs by pursuing four interlocking objectives: (1) rendering the indicators of Cagnin's model explicit and measurable; (2) integrating accounting measurement grounded in SAK EMKM to ensure financial transparency; (3) introducing the value activities of risk management as well as metrics and targets in accordance with PSPK-1 to reinforce sustainability disclosure; and (4) digitising the model into a web-based self-assessment system. This article concentrates on the construction and design phase encompassing indicator decomposition, the alignment of accounting parameters, and the development of the information-system architecture.

2. RESEARCH METHOD

This study adopts a conceptual research design, in which the primary output is a theoretically grounded model rather than empirically tested findings. The investigation follows an exploratory qualitative approach intended to probe the practices, perceptions, and processes through which MSMEs manage sustainability, with a view to identifying the dimensions, indicators, and developmental stages that constitute an accounting-based maturity model. The prototyping of the BSMM unfolded across five interconnected stages: (1) selection of the foundational model and narrative analysis; (2) extraction of measurement indicators from Cagnin (2005); (3) incorporation of accounting measurement derived from SAK EMKM; (4) addition of value activities derived from PSPK-1; and (5) operationalisation of the model into a self-assessment questionnaire complemented by interpretation, recommendation, and a web-based platform.

The selection of the foundational model proceeded through a systematic search of publications addressing Business Sustainability Maturity in Scopus and Google Scholar covering the years 2000–2025. Cagnin's (2005) model was chosen as the point of departure because it is the most thematically congruent, has been widely cited, and provides detailed descriptions of organisational conditions at each maturity level for every value activity. The narrative analysis was conducted in three sequential steps: (a) translation of the original descriptions into Indonesian and arrangement into a value-activity-by-maturity-level matrix; (b) grouping of narrative points according to substantive similarity, with each cluster designated as an indicator; and (c) condensation of the narratives into concise, operational level descriptors. The narrative analysis was conducted by the lead author as a single coder, an approach considered appropriate given the analysis drew on a single, clearly bounded foundational source (Cagnin, 2005) and followed an explicit, criterion-based clustering procedure. Coding decisions, including cluster boundaries and indicator naming, were documented in an audit trail and periodically discussed with co-authors to support analytical transparency; the absence of formal inter-coder corroboration at this stage is acknowledged as a limitation. The detailed execution of each step, including the criteria applied for clustering and the use of backward mapping for missing descriptors, is reported in the Results section.

The infusion of accounting measurement was carried out through a careful reading of the pertinent paragraphs of SAK EMKM (Ikatan Akuntan Indonesia, 2018), covering the presentation of financial statements (Chapter 3), the statement of financial position (Chapter 4), the statement of profit or loss (Chapter 5), notes to the financial statements (Chapter 6), financial assets and liabilities (Chapter 8), fixed assets (Chapter 11), intangible assets (Chapter 12), and the recognition and measurement of expenses (Chapter 14). Each BSMM indicator was then scrutinised to determine whether accounting measurement was warranted and, if so, which paragraph of SAK EMKM would serve as the governing reference.

The augmentation with PSPK-1 was undertaken by examining its core paragraphs (Dewan Standar Akuntansi Keuangan Ikatan Akuntan Indonesia, 2025), namely paragraph 25 (components of disclosure), paragraphs 43–44 (risk management), and paragraphs 45–51 (metrics and targets). On the strength of these provisions, two new value activities together with their constituent indicators were formulated. The level-one to level-five descriptors were generated through backward mapping, whereby full compliance with PSPK-1 is positioned as Level 5 and successively lower descriptors are derived in proportion to the readiness of MSMEs to satisfy each disclosure requirement.

The operationalisation phase culminated in the design of a self-assessment questionnaire employing a 1-to-5 scale, with each scale point reflecting the descriptor of the corresponding maturity level. The web-based platform was developed using React and Vue for the front-end, Node.js as the back-end runtime, and Prisma ORM linked to a MySQL database. This architecture enables real-time processing, allowing MSMEs to obtain their maturity scores, graphical visualisations, interpretations, and recommendations immediately upon completing the questionnaire.

Subsequent to the five prototyping stages described above, four additional validation procedures were undertaken to ensure the rigour and usability of the model, instrument, and platform. First, model validation was conducted through expert judgment, in which 21 experts across four domains: sustainability ($n = 3$), accounting ($n = 10$), business/management ($n = 4$), and MSME practice ($n = 4$), each with a minimum of three years of relevant professional experience and drawn from academics, practitioners, and policymakers, independently reviewed and assessed the model's construct, indicator structure, and level descriptors for relevance, completeness, and contextual appropriateness. Expert assessment was guided by Ory's meta-evaluation framework for evaluating assessment activities (Ory, 1992), operationalised into a 48-item questionnaire spanning four standards: utility (whether the assessment meets practical information needs), feasibility (whether the assessment is realistic and prudent), propriety (whether the assessment conforms to legal and ethical standards), and accuracy (whether the assessment is technically adequate). Each item was rated on a five-point Likert scale (Strongly Disagree to Strongly Agree), supplemented by open-ended questions inviting experts' improvement suggestions. Second, instrument testing was carried out through a pilot test involving 255 MSME respondents across ten Indonesian provinces, examining the clarity, comprehensibility, and practical usability of the self-assessment questionnaire. Third, system testing was performed to verify the functional integrity, usability, and reliability of the web-based platform across device types. Fourth, full implementation of the model among MSME users. These validation and testing procedures have been completed; their detailed protocols, participant profiles, results including descriptive statistics and the qualitative synthesis of expert feedback and implications are reported in a companion paper currently under preparation, in order to maintain the focus of the present article on the conceptual development and theoretical grounding of the model.

3. RESULTS AND DISCUSSIONS

Selection of the Foundational Model and Its Characteristics

A literature search across Scopus and Google Scholar (2000–2025) using the key phrase "Business Sustainability Maturity" yielded nine relevant publications after deduplication, of which only three substantively constructed a sustainability maturity model: Cagnin et al. (2005), Meza-Ruiz et al. (2017), and Lewandowska et al. (2025). Cagnin's (2005) model was selected for its comprehensive description of organisational conditions at each maturity level across seven value activities strategy,

partnership, motivation, competence, communication, technology, and operations mapped onto five levels: Ad Hoc, Planned in Isolation, Managed with No Integration, Excellence at Corporate Level, and High Performance Sustainability Net.

Despite its comprehensiveness, Cagnin's model exhibits three shortcomings that this study addresses: first, measurement indicators are not explicitly articulated but remain embedded in lengthy, unevenly distributed narratives; second, the model lacks an accounting perspective, omitting the measurement foundation indispensable for MSMEs; and third, having been designed for large corporations, several elements do not translate seamlessly into small-enterprise realities.

Identification of Measurement Indicators from Cagnin's (2005) Model

Indicator identification proceeded through three narrative-analysis steps: matrix arrangement of source material, clustering by substantive affinity, and condensation into operational descriptors a procedure consistent with established qualitative data reduction approaches (Humble & Mozelius, 2022; Khokhar et al., 2020). This exercise produced twenty-one indicators distributed across the seven value activities, as displayed in Table 1.

No	Value Activity	Indicator
1	Strategy	a. Integration of sustainability into the business; b. Sustainability values, vision, and objectives; c. Sustainability supporting processes
2	Partnership	a. Partner selection; b. Partnership structure
3	Motivation	a. Behavioural processes and structures; b. Empowerment; c. Collaborative environment; d. Training
4	Competence	a. Information and knowledge management; b. Capability enhancement
5	Communication	a. Sustainability promotion; b. Communication channels
6	Technology	a. IT resources; b. Information systems; c. Role of IT
7	Operations	a. Sustainability management; b. Sustainability data; c. Sustainability performance measurement; d. Integration of sustainability into operational processes; e. Management of social-environmental impacts

The choice of a five-level scheme was guided by the consideration that it strikes an optimal balance between granularity and parsimony (Abed & Rashid, 2023; Sadiq et al., 2021), aligns naturally with the Likert scale (Correia et al., 2023; Ollis et al., 2024), and enjoys widespread adoption in established frameworks such as CMMI (Fariz et al., 2023; Tocto Cano et al., 2020) and BPM (Curtis & Alden, 2007; Kalinowski, 2020). Each indicator description traces the evolution of organisational practice from its most rudimentary state (Level 1) to its highest expression of maturity (Level 5). For instance, in the case of the indicator "integration of sustainability into the business," Level 1 portrays sustainability as a regulatory burden alone, whereas Level 5 depicts it as a profit centre and the nucleus of long-term strategy. Where Cagnin's original text already supplied a level descriptor, that wording was retained; where it did not, the missing descriptors were composed using backward mapping, a technique adapted from policy implementation research (Ekane et al., 2020; Elmore, 1979), which starts from a desired end state and reasons systematically backward to identify the conditions required at each preceding level.

Incorporation of Accounting Measurement Based on SAK EMKM

The incorporation of accounting measurement ensures each BSMM indicator is supported by valid, consistent, and auditable bookkeeping practices (Adekoya & Ojediran, 2024; Uyar et al., 2017). SAK EMKM 2018 was selected as the reference standard due to its explicit tailoring for MSMEs' reporting needs (Fajri et al., 2022; Meidawati & Oktari, 2022; Ramadhanti et al., 2019). Notably, not every indicator warranted accounting measurement. Only those directly related to financial transactions, costs, assets, or reporting received an accounting overlay, whereas relational, cultural, or purely qualitative indicators did not, thereby preserving their strategic significance.

Within the Strategy value activity, all three indicators received accounting measurement: financial statement preparation reflecting transparent reporting capacity (Renaldo et al., 2021;

Sulistyowati et al., 2024); recognition of intangible assets for sustainability values such as brand and reputation (Malikah & Nandiroh, 2024; Oprean-Stan et al., 2020); and recording of social-related expenses in the profit/loss statement and NFS (Ikatan Akuntan Indonesia, 2018; Thuy et al., 2021). Within Partnership, neither indicator received an accounting approach, as the dimensions measured: trust, collaboration, and social capital, are predominantly relational and would lose meaning if reduced to accounting figures (Chakkol et al., 2018; Järvinen et al., 2020).

Within Motivation, human-resource expenses (wages, incentives, training, welfare) were recorded for behavioural processes (Ikatan Akuntan Indonesia, 2018; Kwon, 2017), and training/HR development budgets for the training indicator (Schröder et al., 2022; Szczepańska-Woszczyna & Kurowska-Pysz, 2016). Empowerment and collaborative environment indicators received no separate treatment, as they are subsumed within HR expense records or are cultural in nature. Within Competence, information/knowledge management was linked to financial and non-financial statement presentation, while capability enhancement was associated with training and competence-development budget recording (Schröder et al., 2022). Within Communication, neither indicator received accounting treatment, as both center on information dissemination and trust cultivation, dimensions better assessed through interaction quality than financial bookkeeping. Within Technology, only IT-resources received accounting measurement, whereas hardware/software recorded as fixed assets. Information-systems and role-of-IT indicators remain qualitative and introduce no new financial line items.

Within Operations, three indicators received an accounting overlay: sustainability management through energy/water/waste expense recording and NFS disclosure (Ardiana et al., 2023); sustainability performance measurement through profit, social-contribution, and environmental cost recording (Ardiana et al., 2023; Endiana et al., 2020; Ikatan Akuntan Indonesia, 2018); and social-environmental impact management through impact-treatment and prevention expense recording. Sustainability data and operational integration indicators were excluded due to their systemic nature.

Table 2. Mapping of accounting measurement additions onto BSMM indicators

Value Activity	Indicator	Accounting Measurement
Strategy	Integration of sustainability into the business	Recording of transactions & complete financial statements
	Sustainability values, vision, objectives	Recording of intangible assets
	Sustainability supporting processes	Sustainability expenses in the statement of profit or loss
Partnership	Partner selection & partnership structure	No addition
Motivation	Behavioural processes & structures	Human-resource expenses
	Empowerment	No addition (subsumed within HR expenses)
	Collaborative environment	No addition
	Training	Training & HR development expenses
Competence	Information & knowledge management	Presentation of financial / non-financial information
	Capability enhancement	No addition
Communication	Promotion & communication channels	No addition
Technology	IT resources	IT fixed assets
	Information systems & role of IT	No addition
Operations	Sustainability management	Energy, water, waste expenses
	Sustainability data & integration	No addition
	Sustainability performance measurement	Profit, social expenses, efficiency benefits
	Management of social-environmental impacts	Impact-treatment & impact-prevention expenses

The accounting overlay at each maturity level is structured progressively. At Level 1, no separate recording exists; all expenses are commingled in general accounts. At Level 2, simple expense recognition begins, though still undifferentiated. At Level 3, recording becomes more systematically structured. At Level 4, sustainability-related items are clearly segregated within financial statements and periodically evaluated. At Level 5, sustainability bookkeeping and reporting are systematic, transparent, and audit-ready as part of sustainability accountability.

Addition of Value Activities Based on PSPK-1

On 1 July 2025, the Sustainability Standards Board of the Indonesian Institute of Accountants promulgated PSPK-1 and PSPK-2. Although not directed at MSMEs, large corporations adopting these standards will routinely require sustainability data from their MSME vendors and supply-chain partners, making MSME readiness in PSPK-1 domains an increasing competitive advantage.

Paragraph 25 of PSPK-1 prescribes four disclosure components: governance, strategy, risk management, and metrics and targets (Dewan Standar Akuntansi Keuangan Ikatan Akuntan Indonesia, 2025). Governance and strategy are already covered by the seven value activities adapted from Cagnin's model; however, risk management and metrics and targets remain unaddressed, necessitating two additional value activities. The Risk Management activity enables MSMEs to identify, assess, prioritise, and monitor sustainability-related risks and opportunities (paragraphs 43–44), articulated through three indicators: Risk Process, Opportunity Process, and Risk–Opportunity Integration. The Metrics and Targets activity (paragraphs 45–51) bridges sustainability strategy and measurable outcomes through two indicators: Metrics (paragraph 46) and Targets (paragraph 51).

Table 3. New value activities and indicators derived from PSPK-1

Value Activity	Indicator	PSPK-1 Reference
Risk Management	Risk Process	Paragraph 44(a)
	Opportunity Process	Paragraph 44(b)
	Risk–Opportunity Integration	Paragraph 44(c)
Metrics and Targets	Metrics	Paragraph 46
	Targets	Paragraph 51

Level descriptors for the new indicators were composed using backward mapping, with Level 5 representing full PSPK-1 compliance: integrated risk and opportunity processes, measurable metrics, explicit targets with application and base periods, and transparent disclosure. Level 4 denotes routinely documented, data-driven processes that fall short of complete disclosure, particularly regarding temporal scope (short, medium, and long term). Level 3 captures processes that exist but remain internal and informal. Level 2 indicates nascent, ad hoc, and reactive awareness. Level 1 represents the most rudimentary condition, with neither system nor awareness in place.

The Final Business Sustainability Maturity Model for MSMEs

The final BSMM comprises nine value activities and 26 indicators. The first seven value activities constitute an adaptation of Cagnin (2005) furnished with explicit indicators and accounting measurement grounded in SAK EMKM, while the last two represent novel additions derived from PSPK-1. The indicators are distributed as follows: Strategy (3), Partnership (2), Motivation (4), Competence (2), Communication (2), Technology (3), Operations (5), Risk Management (3), and Metrics and Targets (2). Each indicator is accompanied by a description at all five maturity levels; indicators with accounting relevance are further accompanied by the corresponding accounting practice. The visualization of the model can be seen in Figure 1.

Within Strategy, the integration-of-sustainability indicator progresses from viewing sustainability as a regulatory burden toward embedding it as the nucleus of long-term strategy. Accounting-wise, this mirrors a transition from absent recording toward accrual-based bookkeeping and complete financial statements with NFS. The sustainability values indicator evolves from non-recognition to internalised culture, with intangible assets (trademarks, certifications, software) progressing from being overlooked to formally recorded as strategic capital. The supporting-processes indicator moves from feeble, individual-dependent support toward formal, innovation-grounded processes, with sustainability expenses becoming separately identified and deployed in strategic decision-making.

Within Partnership, the partner-selection indicator advances from cost-driven orientation toward trust-based, sustainability-aligned relationships. The partnership-structure indicator evolves

from hierarchical arrangements into a symbiotic network fostering learning and stakeholder empowerment.

Within Motivation, the behavioural-processes indicator traces cultural development from compliance-driven behaviour toward collective learning and work-life balance, with labour and welfare expense recording becoming progressively systematic. Empowerment and collaborative-environment indicators evolve from competition toward strategy-aligned collaboration. The training indicator progresses from no sustainability training toward a formal system, with training expenses transitioning from unrecorded to strategic HR investments disclosed in the NFS.



Figure 1. Final model visualization

Within Competence, information-and-knowledge-management evolves from administrative handling into a strategic resource, reflected in the transition from manual bookkeeping to an integrated accounting information system supporting real-time financial and non-financial analysis. The capability-enhancement indicator progresses from neglect toward competence development founded on experience and knowledge management.

Within Communication, both promotion and communication-channel indicators advance from minimal engagement toward an organisational culture of collaborative, cross-stakeholder knowledge exchange grounded in learning and trust.

Within Technology, IT-resources evolve from automation tools into strategic infrastructure, with technology expenditure transitioning from generic expense recording toward capitalisation, depreciation, and transparent disclosure. The information-systems indicator progresses toward big data and intelligent applications, while the role-of-IT evolves into a flexible infrastructure supporting collaboration and business-network sustainability.

Within Operations, sustainability management transitions from reactive posture toward integrated change management, reflected in the adoption of cost-benefit analysis encompassing economic, social, and environmental dimensions. The sustainability-performance-measurement indicator evolves comprehensively: economically from rudimentary cost recording toward ROI assessment; socially from non-recording toward systematic capture in financial statements; and environmentally from unrecorded expenses toward performance indicators within sustainability

reports. The social-environmental impact-management indicator progresses from end-of-pipe remediation toward integrated stakeholder-engaging stewardship.

Within Risk Management, the risk-process indicator advances from absent risk management toward a comprehensive system integrated with business strategy. The opportunity-process indicator evolves from non-recognition toward incorporation as long-term strategic elements analysed for their bearing on financial position and cash flow. Risk-opportunity integration progresses from separate handling toward an encompassing sustainability-risk management system.

Within Metrics and Targets, the metrics indicator evolves from elementary data recording toward formal indicators quantifying economic, social, and environmental impacts on corporate performance. The targets indicator advances from mere intent toward measurable, periodically monitored targets integrated with corporate policy and transparently disclosed to stakeholders.

Comparative Positioning of the BSMM

The BSMM's design choices can be clarified by positioning it against established maturity frameworks across key dimensions, as shown in Table 4.

Table 4. Comparative analysis of the BSMM with established maturity frameworks

Dimension	CMMI (Paulk et al., 1993)	BPM (Curtis & Alden, 2007)	CSR Maturity Model (Maon et al., 2010)	Sustainability Maturity Model (Meza-Ruiz et al., 2017)	BSMM (This Study)
Primary domain	Software/process	Business process	Corporate social responsibility	Business sustainability (general) Manufacturing & service companies (not MSME- specific)	Business sustainability for MSMEs
Target organisation	Large/medium	Large/medium	Large corporation		MSMEs
Number of levels	5	5	5 (per cultural/strategic dimension)	5	5
Measurement basis	Process capability	Process maturity	Cultural and strategic stakeholder orientation (qualitative)	Best-practice checklist (qualitative)	Accounting- based + qualitative
Accounting integration	None	None	None	None	SAK EMKM 2018
Disclosure standard alignment	None	None	None	None	PSPK-1 (national)
Theoretical grounding	CMM/process theory	Process theory	Stakeholder culture theory	Triple bottom line	Stakeholder Theory
Digital operationalisation	Varies	Varies	None reported	None reported	Web-based platform
Developing- economy / MSME context	No	No	No	No	Yes (Indonesia)

The comparison indicates that the BSMM is the only framework among those reviewed that simultaneously combines accounting-based measurement, alignment with a national disclosure standard, explicit MSME orientation, and digital accessibility, a configuration that distinguishes it from process-oriented frameworks (CMMI, BPM) as well as from sustainability- and CSR-oriented frameworks designed primarily for large organisations.

Value-Added Analysis Relative to the Foundational Model

To clarify the incremental contribution of each prototyping stage, Table 5 traces the value added at each step relative to Cagnin's (2005) original model.

Table 5. Value-added analysis across prototyping stages

Stage	Baseline Condition	Value Added	Resulting Capability
1. Foundational model & narrative analysis	Lengthy, unevenly distributed narrative across 7 value activities	Decomposition into 21 explicit, clustered indicators	Operationalised, measurable indicators
2. Accounting overlay (SAK EMKM)	No prior accounting overlay existed	Accounting measurement linked to 10 of 21 indicators	Ability to measure conformance with SAK EMKM
3. PSPK-1 alignment	No linkage to disclosure standards	2 new value activities, 5 new indicators (Risk Management; Metrics & Targets)	Alignment with national sustainability disclosure requirements
4. Digital operationalisation	Typically paper-based/facilitator-dependent self-assessment in comparable models	39-item questionnaire embedded in a web platform with instant scoring	Facilitation-free, scalable diagnostic instrument
5. Validation (reported in companion paper)	Untested conceptual model	Expert judgment, MSME pilot testing, system testing	Empirically grounded confidence in relevance and usability

Each stage therefore contributes a distinct, non-redundant increment of value: stage 1 yields measurability, stage 2 yields conformance with accounting standards, stage 3 yields standards alignment, and stage 4 yields accessibility, collectively transforming a narrative, large-corporation framework into an accounting-grounded, standards-aligned, digitally deployable instrument for MSMEs.

Operationalisation of the Model in a Web-Based Self-Assessment System

The BSMM has been operationalized through three inseparable artifacts: (1) the five-level BSMM table; (2) a self-assessment questionnaire with interpretations and recommendations; and (3) a web-based self-assessment platform. The questionnaire comprises 39 items across 26 indicators, with responses on a 1-to-5 scale representing the MSME's maturity level. Each response is accompanied by an interpretation and actionable recommendations.

The web-based platform, available at <https://mkbk.web.id>, enables MSMEs to conduct self-assessments without researcher facilitation. It is accessible via desktop, mobile, and tablet without requiring installation, making it well-suited to MSME infrastructural limitations. Key features include user registration/login, a structured digital questionnaire with response validation, automatic progress saving, and instant reporting with per-activity and aggregate maturity scores alongside radar and bar charts. It also features result interpretation, improvement recommendations, an assessment history, and flexible multi-device access. The novelty of this operationalization lies in the digitization of the assessment instrument, rendering the process more efficient, accurate, and readily updatable in response to standard revisions.

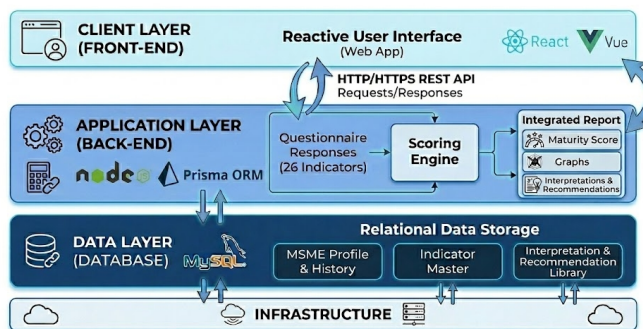


Figure 2. Web system architecture

Three inherent characteristics of self-assessment instruments warrant acknowledgement. First, response accuracy depends on the respondent's candour and familiarity with their own organisational practices, although operationally specific level descriptors are designed to minimise subjective interpretation. Second, the platform does not incorporate automated accounting data verification, as it is intended as a diagnostic tool rather than an auditing device; respondents are encouraged to substantiate responses with documentary evidence such as financial statements and operational reports. Third, self-assessed scores may differ from independent auditor assessments, particularly at higher maturity levels; such divergence is expected and constructive, serving as a diagnostic signal for where organisational perception and verifiable practice diverge most significantly.

The Novelty and Implications of the Model

The BSMM introduces four complementary dimensions of novelty, each addressing one of the gaps identified in the introduction. First, Cagnin's (2005) model has been decomposed into 21 indicators with concise level descriptors, improving implementability and measurability. Grounded in Stakeholder Theory, each maturity level represents a qualitatively distinct stage in the organisation's capacity to recognise and respond to stakeholder expectations, making the descriptors not merely measurement criteria, but markers of an organisation's evolving stakeholder orientation. Second, integration of SAK EMKM 2018 reinforces the quantitative and accountable dimension of relevant indicators, supporting MSME financial reporting quality as a precondition for financing access. From a Stakeholder Theory perspective, accounting transparency is a direct response to the accountability expectations of creditors, regulators, and supply-chain partners. Third, two new value activities derived from PSPK-1 (2025) align the model with the national sustainability disclosure standard, preparing MSMEs for transparency demands of larger corporate supply-chain partners, reflecting the expanding stakeholder horizon at higher maturity levels. Fourth, the web-based platform renders the model directly usable without intensive facilitation, while opening prospects for large-scale data collection on Indonesian MSME maturity profiles.

Beyond its specific contributions, the BSMM expands upon maturity theory in two respects. Existing maturity models, whether process-oriented (CMMI, BPMM) or sustainability-oriented (Corporate Sustainability Maturity Model, Sustainability Maturity Model), were designed for large organisations and treat maturity progression as a universal, context-free trajectory. The BSMM departs from this assumption by embedding context-specific standards (SAK EMKM, PSPK-1) directly into the maturity descriptors, making the progression trajectory accountable to the institutional and regulatory environment of Indonesian MSMEs. Furthermore, by grounding maturity levels in Stakeholder Theory, the BSMM reframes progression not as internal capability accumulation alone, but as the progressive broadening of an organisation's stakeholder accountability, a theoretical reorientation that has not previously been operationalised in maturity model design. This operationalisation is made explicit in Table 6, which maps each maturity level to its dominant stakeholder orientation, illustrative stakeholder groups, and corresponding accountability mechanism.

Table 6. Stakeholder accountability map across BSMM maturity levels

Maturity Level	Dominant Stakeholder Orientation	Illustrative Stakeholder Groups	Accountability Mechanism
Level 1	Compliance-driven, narrow	Tax authorities, creditors	No separate recording; commingled accounts
Level 2	Reactive, transactional	Creditors, regulators	Simple, undifferentiated expense recognition
Level 3	Functional, internally segmented	Employees, immediate customers	Systematically structured but siloed recording
Level 4	Integrated, cross-functional	Employees, customers, suppliers	Segregated sustainability accounts, periodic evaluation
Level 5	Co-creative, network-wide	Community, supply-chain partners, regulators, broader society	Systematic, transparent, audit-ready disclosure (PSPK-1 compliant)

As maturity advances from Level 1 to Level 5, the stakeholder base addressed by the organisation widens correspondingly from the most salient, compliance-oriented parties toward the full range of actors capable of affecting or being affected by its operations (Freeman, 1984; Freeman et al., 2010; Mitchell et al., 1997).

Theoretically, the study demonstrates that Stakeholder Theory can serve as a generative grounding for maturity level design, extending the theory's empirical reach to small enterprises in developing economies. Methodologically, the five-stage prototyping procedure: combining narrative analysis, backward mapping, accounting overlay, and disclosure-standard alignment, offers a replicable template for developing context-specific maturity instruments in other sectors or national settings. For policy, the model suggests that SAK EMKM and PSPK-1 can function not merely as compliance requirements but as developmental benchmarks, while the web platform provides regulators and MSME support agencies with a scalable, facilitation-free diagnostic instrument.

Although grounded in Indonesian standards, the model's core architecture is not inherently Indonesia-specific. SAK EMKM is an adaptation of IFRS for SMEs and PSPK-1 is an adaptation of IFRS S1, meaning the model's foundations are already aligned with globally recognised frameworks. In jurisdictions adopting these international standards, the model can be applied with minimal modification; elsewhere, the five-stage prototyping procedure can be replicated by substituting the relevant national standards at stages three and four. The Stakeholder Theory grounding further supports transferability, as the premise that sustainability depends on meeting diverse stakeholder expectations, holds across institutional contexts.

4. CONCLUSION

The BSMM constitutes a deliberate repositioning of sustainability maturity assessment from a large-corporation diagnostic tool into a contextually grounded instrument for small enterprises in a developing economy. The integration of SAK EMKM shifts sustainability from aspiration into accountability, making claims of responsible practice verifiable rather than merely declarative. The alignment with PSPK-1 carries a forward-looking strategic implication: MSMEs that develop risk management processes and measurable targets will occupy a structurally superior position within supply chains as large corporations begin mandatory sustainability disclosure. Theoretically, the study contributes to maturity model literature by demonstrating that Stakeholder Theory can serve as a generative grounding for maturity level design, reframing maturity progression as the broadening of an organisation's stakeholder accountability rather than the accumulation of internal capability alone, and extending the theory's empirical reach to small enterprises in developing-economy contexts. Methodologically, it offers a replicable five-stage prototyping procedure for developing accounting-integrated maturity instruments. Practically, it equips MSME operators, regulators, and supply-chain partners with a standardised, facilitation-free sustainability assessment tool. Collectively, these theoretical, methodological, and practical contributions position the BSMM as an instrument that advances sustainability theory while delivering contextually grounded value for MSMEs.

The model's ultimate value will nonetheless be determined empirically. As a conceptual study, the BSMM has not been subjected to empirical validation within this article's scope. Expert validation, pilot testing with MSME respondents, and full platform implementation have been completed and are reported in a companion paper currently under preparation. Future research is encouraged to refine the model, psychometric properties and explore its applicability across diverse MSME sectors and developing-economy contexts.

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