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Measuring What Matters: Content-Validity Assessment of an Information Management and Inventory Replenishment Decision Instrument for SMEs

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Abstract

This study assesses the content validity of a questionnaire intended to capture information-management capabilities and inventory replenishment decision processes among small and medium-sized enterprises (SMEs). Guided by organisational information-processing theory and established scale-development principles, the instrument initially comprised 27 items representing seven constructs: information governance, data integration capability, information quality, analytical capability, decision information use, replenishment decision uncertainty, and replenishment decision effectiveness. The item-level evaluation records ratings by six assessors using a four-point relevance scale. Item-level content validity (I-CVI), average scale-level content validity (S-CVI/Ave), and universal-agreement content validity (S-CVI/UA) were calculated. Eighteen items received unanimous relevance endorsement, six were endorsed by five assessors, and three by four assessors. Twenty-four of 27 items met the I-CVI screening criterion of 0.78, yielding S-CVI/Ave = 0.926 and S-CVI/UA = 0.667. The three flagged items—DIU4, RDU4, and RDE3—require closer attention to conceptual boundaries between information use, uncertainty and outcomes. The study contributes an item-level content-validation account and an explicit revision trail for an SME inventory questionnaire. Content relevance is a necessary, but not sufficient, basis for later evidence of dimensionality, reliability, response processes or criterion validity.

Keywords: Content Validity, Content Validity Index, Questionnaire Development, Information Governance, Inventory Replenishment, SMES

Introduction

Inventory replenishment requires organisations to interpret stock positions, demand patterns, supplier commitments and purchasing histories when deciding when and how much

to order. For SMEs, these decisions depend on more than technology ownership: inventory records need clear governance, cross-source integration, sufficient quality, analytical interpretation and use in a specific ordering choice. Decision-support research demonstrates the practical relevance of inventory planning in smaller enterprises (Teerasoponpong & Sopadang, 2022), while data-governance studies specify organisational mechanisms for managing information resources (Abraham et al., 2019; Goel et al., 2024). However, a decision-support application or a conceptual governance framework does not, by itself, provide evidence that questionnaire items can distinguish the information-management conditions, decision behaviours, uncertainty and effectiveness involved in replenishment.

This distinction creates a measurement problem. Instruments that combine data infrastructure, staff capability, information use, external uncertainty and perceived outcomes may inadvertently treat these different domains as interchangeable. Existing literature provides conceptual guidance on information quality (Wang & Strong, 1996), governance (Abraham et al., 2019; Goel et al., 2024), and inventory decision support (Teerasoponpong & Sopadang, 2022), but these sources are not validation studies of the present seven-domain replenishment questionnaire. Established scale-development approaches require explicit domain definitions, defensible item wording and assessment of content relevance before respondent-level psychometric testing (Boateng et al., 2018; Hinkin, 1998; Haynes et al., 1995; Koller et al., 2017). The outstanding question is therefore not whether information management matters, but whether an integrated instrument adequately represents its distinguishable components at the level of SME replenishment decisions.

The proposed instrument extends these approaches in three bounded ways. First, it brings together seven separately defined domains within a single replenishment-focused measurement architecture: information governance (IG), data integration capability (DIC), information quality (IQ), analytical capability (AC), decision information use (DIU), replenishment decision uncertainty (RDU) and replenishment decision effectiveness (RDE). Second, it differentiates organisational arrangements (IG and DIC), the condition of decision inputs (IQ), interpretive capability (AC), enacted information-use behaviour (DIU), task uncertainty (RDU) and perceived decision outcomes (RDE). This distinction makes potential item contamination identifiable—for example, when an information-use statement also measures analytical evaluation, or when an uncertainty statement instead reflects poor information quality. Third, rather than assuming the proposed architecture is adequately measured, the study reports item-by-item relevance agreement and a transparent revision trail for the complete initial 27-item pool. This is an integrated domain-specification and content-screening contribution, not a claim to have invented these constructs or established their empirical distinctiveness.

Zaid and Hussin (2024) provide a related Malaysian methodological precedent for applying questionnaire content-validation procedures to social-media crowdfunding, but their instrument addresses a different domain. The present study transfers the procedural emphasis on transparent appraisal—not the validity of those items—to SME inventory replenishment. Specifically, the study asks which of 27 proposed items receive favourable relevance assessments from six raters and where construct boundaries require refinement. Its objectives are to (i) specify the seven domain boundaries; (ii) report item- and scale-level relevance agreement; and (iii) identify targeted revisions for items below the prespecified

screening criterion. Its contribution is therefore an auditable, context-specific starting point for subsequent cognitive and psychometric validation, not proof of an established seven-factor structure or of relationships among constructs in an SME population.

Theoretical and Measurement Foundations

Organisational Information-Processing Perspective

Organisational Information Processing Theory (OIPT) proposes that uncertainty in organisational tasks creates information-processing demands that must be matched by suitable arrangements (Galbraith, 1974). In inventory replenishment, IG and DIC describe arrangements for stewardship and reconciliation of records; IQ describes the fitness of those records for a particular ordering task; AC concerns the capability to interpret stock, demand and supplier evidence; and DIU concerns whether that evidence is actually consulted or applied in making an order. RDU is distinguished as the unpredictability of demand, supply or replenishment requirements, rather than simply deficient information, while RDE concerns the perceived appropriateness and timeliness of decisions rather than the availability of data or analytical ability. Taken together, the seven domains translate an information-processing perspective into a candidate measurement sequence from information arrangements and inputs to use, task conditions and perceived outcomes. This sequence guides content classification and does not assert verified temporal ordering or factor structure.

Domain Specification and Candidate Item Development

Wang and Strong (1996) establish that information quality extends beyond accuracy to contextual relevance and accessibility. Governance research separates responsibility and stewardship from data-output quality (Abraham et al., 2019; Goel et al., 2024), whereas decision-support research illustrates the distinct task of choosing sourcing and inventory actions (Teerasoponpong & Sopadang, 2022). The instrument accordingly assigns separate item domains to seven constructs rather than asking respondents to rate undifferentiated digital maturity or operational success. Four candidate items were prepared for each of IG, DIC, IQ, AC, DIU and RDU, and three for RDE, yielding 27 items in total. These items were drafted for this study; the cited works provide conceptual grounding and should not be read as the verbatim source or prior validation of their wording. The contribution of this item mapping is its explicit boundary logic: responsibility versus information integration, information quality versus analytical ability, consulting evidence versus evaluating alternatives, uncertainty versus information deficiency, and perceived decision quality versus downstream operational consequences.

Table 1 summarises the proposed domains and item allocations. The arrangement deliberately spans antecedent information-management conditions, information-use behaviour, decision uncertainty and perceived effectiveness so that overlaps can be detected during content appraisal rather than concealed within a single composite measure. The planned seven-domain classification remains provisional until subsequent respondent-based testing demonstrates dimensionality and discriminant validity.

Table 1
Domain specifications and initial item allocation

Construct	Proposed measurement domain	Items
IG	Information responsibilities, controls and record upkeep	4
DIC	Cross-source access, reconciliation and synchronisation	4
IQ	Accuracy, completeness, timeliness and relevance	4
AC	Assessment of demand, suppliers and order alternatives	4
DIU	Information consulted and applied in ordering	4
RDU	Demand, supplier and replenishment uncertainty	4
RDE	Appropriateness, timeliness and emergency purchasing	3

The initial distribution totals 27 items. RDE has three candidate indicators, unlike the four-item allocation for the other domains; retaining adequate outcome-domain coverage after item screening is therefore particularly important.

Meaning And Limits of Content Validity

Content validation asks whether measurement items appropriately represent their intended domain. Haynes et al. (1995) emphasise the centrality of domain coverage, while Koller et al. (2017) show why theoretical definitions and qualitative interpretation matter in addition to numerical ratings. A favourable relevance score does not demonstrate that respondents interpret an item consistently, that indicators form the anticipated dimensions, or that the instrument predicts objective inventory performance (Boateng et al., 2018; Hinkin, 1998).

The Content Validity Index (CVI) provides transparent summaries of expert relevance endorsements, although item-level and scale-level indices reflect different types of agreement (Polit et al., 2007; Yusoff, 2019). The present study therefore combines quantitative thresholds with a domain-based review of potentially ambiguous items rather than relying solely on a single overall index.

Research Methodology

Design and assessment unit

The study used a content-validity assessment of 27 candidate questionnaire items. The available assessment summary contains six rater positions and item-level relevance endorsements. The unit of analysis is the candidate item, not an SME respondent or a replenishment transaction. The six-rater ratings are reported as part of the author-supplied assessment record; the analysis does not attribute unrecorded professional specialisations, recruitment dates or additional qualitative comments to the raters.

Candidate Questionnaire items and Construct Coverage

The complete initial item pool is reproduced in Table 2 to make the wording assessed by the six raters accessible within the main article. The 27 candidates comprise four items each for IG, DIC, IQ, AC, DIU and RDU, together with three RDE items. These are the initial candidate statements considered in the reported content-validity assessment, prior to any recommended revisions.

Table 2
Initial candidate questionnaire items and wording

Code	Item wording
IG1	Our business has clearly assigned responsibilities for maintaining inventory-related information.
IG2	Our business follows established procedures for updating inventory records.
IG3	Access to inventory-related information is managed according to staff responsibilities.
IG4	Our business regularly checks whether inventory information management procedures are followed.
DIC1	Sales and inventory information can be accessed together when replenishment decisions are made.
DIC2	Purchasing records can be reconciled with inventory records.
DIC3	Information from different systems or records can be combined for replenishment planning.
DIC4	Changes in inventory records are reflected in the information used for purchasing decisions.
IQ1	The information available for replenishment decisions accurately reflects current stock levels.
IQ2	Replenishment information contains the necessary details for deciding what to order.
IQ3	Replenishment information is sufficiently up to date when decisions are made.
IQ4	The information available is relevant to the replenishment decisions being considered.
AC1	Our business can analyse historical sales patterns to identify replenishment requirements.
AC2	Our business can compare stock levels with expected demand.
AC3	Our business can analyse supplier performance when planning replenishment.
AC4	Our business can evaluate alternative replenishment quantities using available data.
DIU1	I consult relevant stock records before deciding replenishment quantities.
DIU2	I use sales information when determining replenishment requirements.
DIU3	I consider supplier information when deciding replenishment timing.
DIU4	I use available business information when comparing replenishment alternatives.
RDU1	Customer demand is difficult to predict when making replenishment decisions.
RDU2	Supplier delivery times are difficult to anticipate.
RDU3	Unexpected changes frequently affect our replenishment requirements.
RDU4	The information needed to anticipate replenishment requirements is often uncertain.
RDE1	Our replenishment quantities generally match actual inventory requirements.
RDE2	Replenishment decisions are made before stock shortages become critical.
RDE3	Our replenishment decisions minimise unnecessary emergency purchasing.

Table 2 provides the item-level wording corresponding to the construct abbreviations used in the validity analysis. The subsequent screening results identify which of these original candidate items met the relevance criterion and which require revision; item acceptance is not equivalent to evidence of factorial or predictive validity.

Assessment Scale and Dichotomisation

Relevance was evaluated on a four-point ordinal scale: 1 = not relevant, 2 = somewhat relevant, 3 = quite relevant and 4 = highly relevant. Scores of 3 or 4 were counted as relevance endorsements. The resulting binary count for each item ranges from zero to six. This standard CVI dichotomisation follows the methodological discussion of Polit et al. (2007) and Yusoff (2019). Although the study materials also refer to clarity, the reported numerical tables relate to relevance only; a separate clarity-based claim is not made.

CVI Estimation and Item-Retention Rules

For item i, the item-level content validity index is I-CVI$_i$ = A_i/6, where A_i denotes the number of relevance endorsements. The average scale-level index is S-CVI/Ave = (Σ I-CVI$_i$)/27, and universal agreement is S-CVI/UA = U/27, where U is the number of items rated relevant by all six assessors. With six ratings, five endorsements produce I-CVI = 0.833 and four endorsements produce I-CVI = 0.667. A prespecified threshold of I-CVI ≥ 0.78 therefore corresponds to at least five of six relevance endorsements, consistent with Polit et al. (2007). These indices are descriptive measures of content-relevance agreement, not hypothesis tests. Because chance agreement is a recognised limitation of unadjusted I-CVI (Polit et al., 2007), the agreement-pattern table additionally displays a modified kappa sensitivity calculation, k* = (I-CVI − P^c)/(1 − P^c), where P^c = C(6, A_i) × 0.5^6 under a binary random-rating model. These k* values are derived arithmetically from the reported item endorsement counts rather than from any new rater observations.

Interpretive Approach

Items meeting the numerical criterion were identified as suitable candidates for further instrument testing, subject to their conceptual fit. Items falling below the criterion were reviewed for construct contamination, redundancy and outcome specificity. The proposed actions in the revision matrix are author-developed recommendations; they are not treated as direct quotations or unanimous instructions from the raters. Item revision may change the construct domain and should therefore be subjected to renewed evaluation (Boateng et al., 2018; Koller et al., 2017).

Results

Distribution of Relevance Agreement

Table 3 reports how many of the 27 items received six, five or four relevance endorsements. The table distinguishes the item-level screening outcome from the scale-level summaries, and also provides the chance-adjusted agreement calculation based on the reported counts.

Table 3
Distribution of content-relevance ratings across 27 items

Relevant ratings	Number of items	I-CVI	Modified κ*	Screening action
6/6	18	1.000	1.000	Retain for further testing
5/6	6	0.833	0.816	Retain; review wording where needed
4/6	3	0.667	0.565	Revise or reassess

Eighteen items (66.7%) received unanimous relevance ratings, six (22.2%) were endorsed by five raters and three (11.1%) by four raters. The total of 150 relevance endorsements out of 162 possible item–rater evaluations yields S-CVI/Ave = 0.926; 18 unanimous items yield S-CVI/UA = 0.667. The difference between these two scale indices demonstrates why a strong average content-relevance score should not be described as universal consensus (Polit et al., 2007).

Item-Level Content Validity

Table 4 presents all 27 item-level endorsement counts and screening decisions. Retaining the full item register enables readers to identify the specific indicators responsible for disagreement instead of interpreting a scale-level average without examining its components.

Table 4

Item-level content-validity screening

Item	Construct	Relevance endorsements	I-CVI	Screening
IG1	IG	6/6	1.000	Pass
IG2	IG	6/6	1.000	Pass
IG3	IG	6/6	1.000	Pass
IG4	IG	5/6	0.833	Pass
DIC1	DIC	6/6	1.000	Pass
DIC2	DIC	6/6	1.000	Pass
DIC3	DIC	6/6	1.000	Pass
DIC4	DIC	5/6	0.833	Pass
IQ1	IQ	6/6	1.000	Pass
IQ2	IQ	6/6	1.000	Pass
IQ3	IQ	6/6	1.000	Pass
IQ4	IQ	5/6	0.833	Pass
AC1	AC	6/6	1.000	Pass
AC2	AC	6/6	1.000	Pass
AC3	AC	6/6	1.000	Pass
AC4	AC	5/6	0.833	Pass
DIU1	DIU	6/6	1.000	Pass
DIU2	DIU	6/6	1.000	Pass
DIU3	DIU	6/6	1.000	Pass
DIU4	DIU	4/6	0.667	Review
RDU1	RDU	6/6	1.000	Pass
RDU2	RDU	5/6	0.833	Pass
RDU3	RDU	6/6	1.000	Pass
RDU4	RDU	4/6	0.667	Review
RDE1	RDE	6/6	1.000	Pass
RDE2	RDE	5/6	0.833	Pass
RDE3	RDE	4/6	0.667	Review

A total of 24 items met I-CVI ≥ 0.78. Three items—DIU4, RDU4 and RDE3—had I-CVI = 0.667 and therefore fell below the screening benchmark. Their identification does not imply that their underlying subject matter is irrelevant; rather, their wording or assignment requires further examination before finalising the measurement instrument.

Construct-Level Coverage

Table 5 aggregates the item-level estimates by construct. These descriptive means should be interpreted together with the identity of any low-scoring items, because aggregation may obscure insufficient coverage of one dimension within a construct.

Table 5
Construct-level content-validity summaries

Construct	Candidate items	Mean I-CVI	Below threshold
IG	4	0.958	None
DIC	4	0.958	None
IQ	4	0.958	None
AC	4	0.958	None
DIU	4	0.917	DIU4
RDU	4	0.875	RDU4
RDE	3	0.833	RDE3

All four information-infrastructure and capability domains (IG, DIC, IQ and AC) had mean I-CVI = 0.958 and no items below the screening threshold. The corresponding means for DIU, RDU and RDE were 0.917, 0.875 and 0.833. The RDE finding is particularly consequential: of three proposed outcome items, one was flagged, leaving only two with acceptable item-level relevance scores if RDE3 were removed. An immediate deletion would therefore weaken coverage of a central dependent construct.

Targeted Item-Revision Decisions

Table 6 identifies possible construct-boundary problems underlying the three flagged items. It offers concrete next steps while acknowledging that the relevance count alone does not reveal the reasons for each rater's judgement.

Table 6
Researcher-developed revision matrix for flagged items

Item	Potential measurement concern	Proposed revision action
DIU4	May mix analytical evaluation with information-use behaviour	Revise to refer to using inventory evidence in a specific order decision
RDU4	May conflate uncertainty with inadequate information quality	Remove provisionally or reassess as a distinct information-uncertainty dimension
RDE3	Emergency purchasing also reflects supply conditions beyond decision effectiveness	Reassign as an operational indicator rather than a subjective effectiveness item

For DIU4, clearer behavioural wording would reduce overlap with analytical capability by emphasising consultation of evidence in an actual ordering decision. RDU4 risks equating uncertainty with insufficient information quality; it should be re-evaluated against the intended uncertainty domain. RDE3 concerns emergency purchasing, an outcome affected by supplier reliability and demand shocks as well as decision quality. Reassignment to an operational-outcome module or careful rewriting may therefore be preferable to treating it as a straightforward perceptual effectiveness measure. These are proposed research decisions, not additional expert ratings.

Discussion

Interpreting high average relevance with local disagreement

The results present a useful distinction between scale-level acceptability and item-level sufficiency. S-CVI/Ave = 0.926 is favourable under widely cited CVI guidance, but S-CVI/UA = 0.667 records unanimity for only two-thirds of the candidate items. Polit et al. (2007) discuss the limitations of relying on a single CVI statistic, and Yusoff (2019) emphasises a systematic assessment and reporting process. The three flagged items show why an apparently strong global index does not justify describing every component of the scale as fully content-validated.

The pattern is substantively interpretable in the inventory-replenishment domain. DIU4 lies near the boundary between evaluating order alternatives and actually consulting evidence, while RDU4 may confound the absence of information with genuine uncertainty about future conditions. RDE3 introduces an operational consequence that may be governed by external supply-chain conditions. Domain-specific item screening is therefore necessary even when the higher-level constructs are theoretically defensible. This conclusion is consistent with the conceptual precision advocated by Hinkin (1998) and Koller et al. (2017).

Contribution to SME Information-Management Measurement

The study extends existing measurement practice through a replenishment-specific, seven-domain item map and an item-level audit trail. Its contribution is not another general measure of data governance or analytics maturity: it operationally separates information responsibility (IG), cross-source reconciliation (DIC), fitness of decision inputs (IQ), interpretive ability (AC), consultation of evidence when ordering (DIU), unpredictability of replenishment conditions (RDU) and perceived quality of the resulting decision (RDE). This explicit structure complements governance scholarship (Abraham et al., 2019; Goel et al., 2024), information-quality research (Lem, 2024; Wang & Strong, 1996) and SME inventory decision-support research (Teerasoponpong & Sopadang, 2022) without representing those studies as prior validation of the present items. The three items identified for revision provide a concrete illustration of why construct boundaries matter, even when average content relevance is favourable.

The Malaysian SME questionnaire-validation discussion is also informed by Zaid and Hussin (2024), whose CVI-based study concerns social-media crowdfunding. The methodological connection is relevant because both studies require transparent expert-based screening of researcher-developed measures, while the substantive constructs and decision settings remain different.

Implications for Subsequent Instrument Development

The most important practical implication is to treat expert relevance scores as an early measurement-development checkpoint rather than a terminal validation result. The next defensible steps are to evaluate revised item wording, assess respondent comprehension through cognitive interviewing, and test factor structure, reliability and discriminant validity in a suitable SME sample. Boateng et al. (2018) and Hinkin (1998) outline why these stages should be distinguished. Particularly for RDE, a broader and clearly defined outcome domain may be needed before the construct can be modelled reliably.

Where related research examines information quality and decision information use as predictors of perceived effectiveness, a clear version history of the instrument is essential. Specifically, any additional RDE item included in a later questionnaire must have its own source and content-review record. The present 27-item pool documents only three initial RDE items; it should not be used to imply expert appraisal of a fourth outcome item.

Limitations

The available assessment summary provides item-level relevance endorsement counts but not the assessors' professional profiles, full item-by-rater matrices, written explanations or a separate numerical clarity analysis. Those limits prevent interpretation of why individual raters disagreed or whether item wording was uniformly understood. Moreover, relevance assessments are judgement-based and contingent on the presented domain definitions; different panels or revised items may yield different results (Haynes et al., 1995; Polit et al., 2007). The current evidence addresses content relevance and does not establish construct dimensionality, respondent-level reliability, temporal stability, predictive validity or objective inventory decision effectiveness.

Conclusion

This content-validity assessment examined 27 candidate items across seven proposed constructs for studying SME information management and inventory replenishment. Of the original items, 24 met the predetermined I-CVI screening criterion, with S-CVI/Ave = 0.926 and S-CVI/UA = 0.667. The three lower-scoring items—DIU4, RDU4 and RDE3—identify substantive construct-boundary issues that merit revision or re-evaluation before final scale deployment. The principal contribution is a reproducible, domain-specific account of how content-relevance evidence can inform instrument improvement; it does not replace subsequent examination of respondents' interpretations and empirical measurement properties.

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