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Developing a Model of Readiness for Halal Compliance in Small and Micro Food Industries: A Factor Analysis Study

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ABSTRACT

The increasing demand for Halal-certified products highlights the need for robust organisational readiness among small and micro food enterprises (SMiEs). This study aims to develop and validate a model of Halal compliance readiness using exploratory factor analysis (EFA). Drawing from the readiness organisational for change (ROC) and Readiness of Organisation for Halal Standard Compliance (ROHSC) frameworks, a pretested and piloted questionnaire was distributed to 112 SMiEs. EFA revealed four reliable constructs: motivation for change, informational assessment, perceived compatibility, and efficient communication channels, with Cronbach's alpha values ranging from 0.831 to 0.943. The ROHSC demonstrated good internal consistency (Cronbach's alpha = 0.988) across 34 item forms grouped into seven separate factors. These results indicate that the developed instrument is reliable and can serve as a practical tool for assessing SMiEs' readiness to comply with Halal standards. Practically, this toolkit may assist Halal certification bodies and training providers in identifying readiness levels and providing targeted support. The cross-validation study indicated an acceptable model fit and supported the applicability of the model in other contexts. Further research using confirmatory factor analysis (CFA) is recommended to strengthen its generalisability and reliability across settings.

Keywords: Halal compliance, organisational readiness, small and micro food enterprises (SMiES), readiness model, exploratory factor analysis (EFA), Halal standards

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INTRODUCTION

With the increasing number of worldwide Muslim populations and more concern about Halal products, small and micro enterprises (SMiEs) in Malaysia should seize the opportunity of the growing market. Through placing themselves in the Halal-certified sector, these enterprises can capitalise on and stand to gain to a substantial extent from the booming demand (Hafidz et al., 2023; Nanda & Ikawati, 2020). Despite the benefits of Halal certification, many SMiEs find it challenging to pursue it. The challenges are typically due to complicated application processes as well as stringent regulatory guidelines imposed by the Halal certification bodies (Andespa et al., 2024; Prawiro & Fathudin, 2023; Saiman & Yusma, 2022; Zakaria et al., 2022). The ability of SMiEs to comply with Halal standards is influenced by several factors such as the ability to access adequate resources, availability of adequate infrastructure and a clear understanding of the Halal certification process (Priantina et al., 2023; Riswantini et al., 2023; Sakti & Ramadhani, 2023). In addition, addressing these challenges requires targeted government interventions, particularly through training programmes designed to help SMiEs understand the Halal certification process, enhance their readiness, and effectively manage Halal requirements (Ahmad Nizar et al., 2022; Rafiki, 2020; Tati et al., 2024). In this study, particular attention is given to the factors that enable or hinder Halal certification readiness in small and micro-sized food enterprises.

This study makes use of exploratory factor analysis (EFA) to explore what drives readiness among SMiEs in complying with Halal certification standards. EFA is particularly helpful in breaking down complex information and revealing hidden patterns that shape organisational behaviour (Hair et al., 2021; Jo et al., 2023; Storkholm et al., 2018). Understanding these patterns enables stakeholders to design more focussed and supportive strategies that align with the real challenges faced by SMiEs (Sulfati, 2024). Therefore, EFA is appropriate in this context, as it helps uncover the underlying patterns of readiness behaviour and reveals how different factors are connected.

LITERATURE REVIEW

Organisational readiness for change (ORC), as defined by Weiner (2020), is the collective mindset and willingness of organisational members to implement change. It is determined by the perceived value of the change (motivation) and the assessment of implementation capability, which includes task knowledge, resource availability, and situational factors (Weiner, 2020). In essence, when members view the change as necessary and believe their organisation has sufficient resources, knowledge, and supportive conditions, readiness for change increases (Jamai et al., 2022; Wannasupchue et al., 2019). This theoretical framing is particularly relevant to the context of Halal certification, where readiness reflects both cognitive and structural readiness to adopt new standards that reshape operational practices and organisational culture.

The ORC theory provides a valuable foundation for understanding how SMiEs in Malaysia are ready to comply with Halal certification. According to Weiner (2020), this collective mindset is shaped by two interrelated components: change commitment, which represents members' willingness to pursue change, and change efficacy, which reflects their perceived capability to execute it successfully. Readiness in this context extends beyond structural and procedural arrangements to encompass psychological preparedness, reflecting the shared beliefs, confidence, and determination among organisational members to implement change effectively. In the case of Halal compliance, such readiness embodies the establishment of formal systems and documentation and the collective conviction that the organisation is capable and committed to upholding Halal principles in every operational aspect. Specifically, motivation for change mirrors the organisation's commitment to Halal compliance by emphasising the perceived value and importance of implementing Halal standards (Shea et al., 2014). Informational assessment and efficient communication reflect change efficacy: informational assessment captures members' perceived knowledge and resources required to implement the change (Hannon et al., 2017). Meanwhile, efficient communication, as interpreted here according to Rogers' diffusion framework, encompasses formal and informal channels, both internal and external (e.g., online portals, social media, exhibitions, and training programmes). This can be achieved through which information about Halal compliance is transmitted and accessed to enable the organisation to perform required tasks effectively. In addition, perceived compatibility bridges both commitment and efficacy, signifying how well Halal principles are aligned with existing organisational practices and values. When compatibility is high, members perceive less disruption and greater feasibility, thereby strengthening overall readiness (Rogers, 2014). As highlighted by recent studies (Jo *et al*., 2023; Weiner, 2020), ORC explains whether change occurs and how organisations mobilise their members, resources, and structures to support sustainable transformation. The theory aligns well with the Halal certification process, which demands both behavioural and procedural changes within firms, ranging from documentation and supply chain management to product handling and staff training (Arieftiara et al., 2022; Ruhaya et al., 2024).

Building upon this theoretical understanding, the readiness of SMiEs must also be viewed in the broader context of the global Halal economy, where increasing market demand amplifies the need for compliance readiness. One crucial determinant of successful Halal compliance is the organisation's capacity to adapt to new operational and behavioural standards aligned with Halal principles. This adaptation reflects technical adjustments and the cultivation of an internal culture that upholds Halal values across all levels of operation (Jamai et al., 2022; Md

Nawi et al., 2023; Wahyuni et al., 2024; Wannasupchue et al., 2019). With the global Halal economy projected to reach over USD 7 trillion by 2030 (American Halal Foundation, 2025) and the Halal food sector alone valued at USD 1.43 trillion in 2023 and projected to rise to USD 1.94 trillion by 2028 (DinarStandard, 2024), businesses are increasingly expected to adopt a holistic and sustained commitment to Halal standards (Abd Rahman et al., 2017; Ahmad Nizar et al., 2022; Johari & Khairunnisa, 2019; Rahim et al., 2021). Therefore, readiness for Halal compliance serves as a strategic enabler that aligns religious obligations with global trade competitiveness. However, for SMiEs, fulfiling Halal requirements remains a major challenge due to financial limitations, knowledge gaps, and infrastructural constraints (Ahmad Nizar et al., 2022; Ruhaya et al., 2024). These barriers often result in inconsistent compliance, low certification rates, and difficulties sustaining post-certification practices.

Halal readiness involves more than simply acquiring certification. It reflects a broader organisational commitment to Halal principles (e.g., ensuring supply chain integrity, training employees, staff competency, and continuous system improvement). To stay competitive and maintain consumer trust, businesses must ensure that their operations are fully aligned with Halal standards (Arieftiara et al., 2022). Studies reveal that readiness depends on awareness, commitment, operational restructuring, and adequate resources (Abd Rahman et al., 2017; Masudin et al., 2020; Pratikto et al., 2023; Rahem et al., 2021). Companies that demonstrate a strong and consistent commitment to Halal principles are more likely to gain consumer trust and succeed in markets where Halal certification significantly influences purchasing behaviour (Arieftiara et al., 2022; Priantina et al., 2023).

Hence, examining the readiness of SMiEs through the lens of ORC offers both theoretical and practical value. It helps identify psychological and structural enablers that shape Halal adoption, allowing policymakers and industry agencies to design interventions that strengthen internal capacity. Additionally, understanding what drives readiness also facilitates tailored support that reflects the actual challenges and dynamics of SMiEs, ensuring greater inclusivity and sustainability within the Halal ecosystem.

Exploratory Factor Analysis (EFA) has been widely applied in studies exploring organisational compliance and readiness (Abd Rahman et al., 2017; Azmi et al., 2019; Jaswir et al., 2023; Jo et al., 2023; Razalli, 2018). Nevertheless, due to the unique operational dynamics and resource limitations of SMiEs, the determinants of their readiness for Halal compliance may differ from those in larger firms or across regions. In this context, EFA is used to uncover context-specific readiness components as a basis to develop focussed strategies towards enhancing Halal standard compliance in the SMiEs sector.

METHODOLOGY

A quantitative survey tool is employed to learn from 112 small and micro food businesses that joined five government-initiated Halal training courses. The results highlight problem areas where these businesses most require assistance, providing practical help for better-targeted compliance activity. To develop the survey, we conceptualised and operationalised the antecedents of both Readiness for Organisational Change (ROC) and Readiness for Organisational Halal Standard Compliance (ROHSC) through theoretical foundations and the Nominal Group Technique (NGT) process.

The ROC construct in this investigation comprises four primary measures: motivation for change, informational assessment, perceived compatibility, and effective communication channels. These constructs were derived based on ORC theory and the Diffusion of Innovation (DOI) theory. To make the research practical, an initial discussion with the first focus group was conducted in collaboration with the Halal Development Division of the Ministry of Entrepreneurship and Cooperatives Development. Early engagement with stakeholders allowed the identification of specific compliance challenges commonly faced by SMiEs. This process ensured that the framework was grounded in their actual needs and could be applied effectively in practice.

The dependent variable, ROHSC, was measured using a questionnaire developed through the NGT (Alkharib et al., 2024). The panel consisted of seven senior auditors from the Department of Islamic Development Malaysia (JAKIM), each with more than six years of experience in Halal auditing. These experts were nominated by JAKIM based on their direct involvement in Halal certification work. Their practical experience helped ensure that the instrument captured the most common non-conformance reports noted among small and micro enterprises. The questionnaire was also aligned with the Manual Procedure for Malaysia Halal Certification (Domestic), 2020 (Department of Islamic Development Malaysia [JAKIM], 2020). Using the NGT approach strengthened the content validity of the instrument by combining field knowledge with structured group consensus.

Pretest

Pretesting plays a vital role in survey design, as it helps ensure data quality by identifying potential issues with question clarity and interpretation. This step becomes even more important in cross-cultural research, where discrepancies between languages and references can influence the validity and reliability of questionnaire translations (Aizpurua, 2020; Awang et al., 2023; Muda et al., 2020). The survey was pretested for one month with both academic experts and eligible respondents, following the approach recommended by Ruel et al. (2015) and Presser et al. (2004). The experts involved came from diverse backgrounds, including industrial psychology, Halal management, business, and research design. Their feedback was crucial in confirming that each survey item

was relevant, clearly worded, and accurately reflected the intended constructs. This stage aimed to ensure that the instrument was thoroughly refined and capable of measuring key variables effectively. It also helped minimise potential bias and reduce respondent suspicion before data collection (Boateng et al., 2018; Sekaran, 2019). Behind its use, the process was intended to uncover and correct any weaknesses in the instrument and to eliminate potential misunderstandings before the questionnaire was administered to the sampled respondents (Boateng et al., 2018; Sekaran, 2019).

In order to improve the quality of the pretest, we subsequently conducted a pilot run with five SMiEs entrepreneurs and ten diploma students from the Halal Management School at Darul Quran. This stage assessed the clarity, feasibility, and validity of the survey through individual evaluations and cognitive interviews (Aizpurua, 2020; Muda et al., 2020; Sahid, 2022; Sehrawat et al., 2021). Furthermore, this procedure served to confirm the relevance of the instrument and to facilitate adaptation to the target respondents among SMiEs and food industries. The instrument was then examined, revised, refined, and polished in light of the feedback gathered. After receiving input from academic reviewers and selected respondents, 40% of the questions were modified to resolve problems of repetition, ambiguity, or lack of alignment with the research objectives. Two rounds of pretesting resulted in 77 items for the ROC and ROHSC constructs being refined and finalised for the pilot study.

Pilot Study

The pilot study is a crucial stage for assessing the clarity, reliability, and practicality of the refined instrument. Measurement: The data collected at this point are necessary to the EFA process, which is used to refine the questionnaire items, identify underlying data distributions and enhance overall scale validity (Hair et al., 2019). The pilot also includes results from an updated literature search and field testing on findings, ensuring that the items are underpinned by rigorous research and are appropriate for the population under study (Haw et al., 2022).

The pilot testing was carried out on entrepreneurs who have attended Halal training from five locations in Malaysia, namely Klang Valley, East, and South. The survey information was collected through a decentralised questionnaire, which was administered online and offline between August 21 and October 1, 2024, to gather the necessary data. To preserve a stable solution and ensure the stability in the result, a minimum of 100 respondents is required to yield reliable results in the EFA (Baistaman et al., 2020; Hair et al., 2010; Lorenzo-Seva & Ferrando, 2024; Rahlin et al., 2022). Of the 142 received questionnaires, 30 outliers were identified, leaving only 112 results to be analysed in EFA. Responses are rated on a 10-point Likert scale: (1 = strongly disagree/ not effective, 10 = strongly agree/ effective).

The research design as illustrated in Figure 1 presents the sequential process of the study. It begins with the conceptualisation of theoretical constructs

and the development of the instrument through the NGT. It then outlines the pretesting and pilot stages, which ensured the instrument's validity and clarity. This is followed by data collection and EFA to refine and validate the measurement model for ROC and ROHSC among SMiEs.

Summary of Research Design

The overall research design as shown in Figure 1 followed a sequential and systematic process. It began with the conceptualisation and operationalisation of constructs grounded in ORC and DOI theories. Moreover, the NGT was employed to generate and validate items for the ROHSC construct through expert consensus. The instrument then underwent two rounds of pretesting to refine and ensure its clarity, cultural relevance, and content validity. Finally, a pilot study was conducted to collect quantitative data for EFA, enabling the empirical validation of constructs and the refinement of the measurement model. This sequence ensured that data collection and analysis were theoretically aligned and methodologically rigorous.

RESULTS

EFA was conducted using IBM SPSS Statistics 27, adhering to the five-steps outline recommended by Williams et al., (2010) These steps include data preparation, factor extraction, factor rotation, interpretation, and labelling, to ensure meaningful and statistically robust factor structures.

Exploratory Factor Analysis (EFA) Results for ROC and ROHSC Constructs

EFA results are presented based on four elements: i) total variance explained by the construct, ii) the number of identified factors and their respective items, iii) factor loadings above 0.6 to ensure item relevance, and iv) internal reliability using Cronbach's alpha, with values above 0.7, indicating robust reliability (Awang et al., 2023). This approach offers a clear, validated factor structure that is essential for the effective assessment of Halal compliance readiness.

To establish ROHSC as the dependent variable, we organised the 38 original items into five main groups: (1) raw materials, advertising, and labelling; (2) workers; (3) documentation and records with internal Halal control; (4) processing areas and premises; and (5) equipment and storage. This reorganisation provides a clearer and more consistent factor structure. Although a powerful tool, factor analysis is often criticised for its reliance on researcher judgment in deciding factors, rotation methods, and item retention, which requires systematic decision-making to achieve valid results (Watkins, 2018). Hair et al., (2021) suggest that factor construction should be based on theory and prior studies, with at least three items per factor for reliability. Given that the ROHSC consists of five dimensions and was developed through a self-constructed process – NGT, the analysis and reporting of the findings are presented separately from ROC.

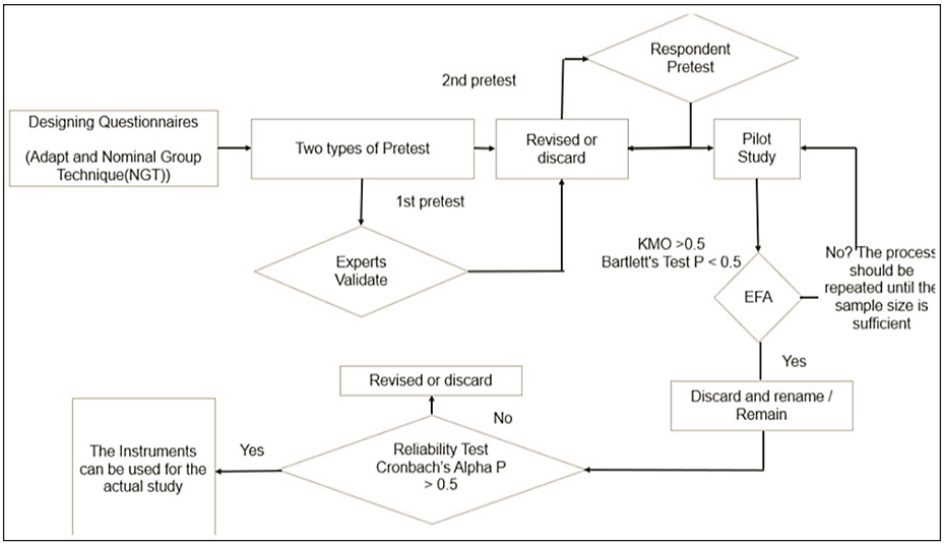

Figure 1. Research design flow from instrument development to data analysis

Sampling Adequacy and Sphericity Test through KMO and Bartlett's Test

As shown in Table 1, the KMO for the four constructs ranged from 0.590 to 0.900. All of them exceeded the common recommended cutoff of 0.500, which suggests that the sample was adequate for factor analysis (Ledesma et al., 2021; Sürücü et al., 2024). Test of Sphericity (Bartlett) was significant for all constructs ($p < 001$), indicating that the correlation matrices are appropriate for factor analysis (Hair et al., 2019; Tabachnick & Fidell, 2019). Both findings provide further evidence of the factorability of the data and the appropriateness of applying EFA to determine sub-dimensions.

Table 2 presents the results of the KMO and Bartlett's tests for the five-factor constructs of the ROHSC model. All KMO values were higher than the ideal cutoff value, suggesting the sample was adequate for EFA analysis. Specifically, group 1 (KMO = 0.878): raw materials, advertising, and labelling; group 3 (KMO = 0.886): documentation and records, and internal Halal control system; group 4 (KMO = 0.890): processing area and premises, and facilities demonstrated high factorability, group 2 (KMO = 0.800): worker and group 5 (KMO = 0.846): equipment and storage, in particular showed strong adequacy. Besides, Bartlett's Test of Sphericity was statistically significant ($p < .001$) for all groups, confirming that the inter-item correlations were sufficiently strong to justify the use of factor analysis (Hair et al., 2019).

Factor Extraction and Total Variance Explained

Factors were extracted using PCA with varimax rotation. This method was chosen to maximise the variance explained by each factor while ensuring factor independence.

Only factors with eigenvalues greater than 1 were retained to determine the number of significant factors (Ehido et al., 2020; Watkins, 2018; Williams et al., 2010). This approach captures the most meaningful underlying dimensions contributing to organisational readiness.

Total Variance Explained for ROC Construct

Table 3 presents the total variance explained for each ROC construct based on Principal PCA. For the motivation construct, one dominant factor was extracted (eigenvalue = 4.655), accounting for 77.584% of the variance, indicating a strong unidimensional structure. Then the informational assessment construct yielded three factors above the eigenvalue threshold: the first explained 58.674%, the second 8.886%, and the third 5.840%. These reflect the multidimensional nature of how information is evaluated in organisations. Otherwise, the perceived compatibility construct revealed two key factors, contributing 66.813% and 20.341% of the total variance, respectively, indicating a dual-dimensional perception of alignment with change. For channel communication, three significant factors emerged, explaining 42.466%, 14.215%, and 12.125% of the variance, demonstrating the multifaceted role of communication channels in readiness. These results highlight that constructs (motivation) show strong single-factor structures, and others (informational assessment, perceived compatibility, and channel communication) are more complex, suggesting targeted strategies may be required to address each dimension effectively.

Table 1
Result of KMO and Barlett's Test for ROC construct

Construct	KMO Value	Bartlett's Test of Sphericity	Approx. Chi-square	df	Sig.
1. Motivation for change	0.900	Yes	684.363	15	0.000
2. Informational assessment	0.857	Yes	2871.840	171	0.000
3. Perceived compatibility	0.781	Yes	559.937	10	0.000
4. Channel communication	0.590	Yes	651.073	45	0.000

Table 2
Result of KMO and Barlett's Test for ROHSC construct

Group	KMO Value	Bartlett's Test of Sphericity	Approx. Chi-square	df	Sig.
Group 1	0.878	Yes	936.413	28	0.000
Group 2	0.800	Yes	341.957	6	0.000
Group 3	0.886	Yes	1228.307	28	0.000
Group 4	0.890	Yes	1290.507	36	0.000
Group 5	0.846	Yes	1471.455	36	0.000

Table 3
Total variance explained for ROC's constructs

Construct	Factor	Initial Eigenvalues Total	Cumulative % of Variance
Motivation	1	4.655	77.584
Informational assessment	1	11.148	
	2	1.688	
	3	1.110	73.400
Perceived compatibility	1	3.341	
	2	1.017	87.155
Channel communication	1	4.247	
	2	1.421	
	3	1.213	68.800

Total Variance Explained for ROHSC Construct

Table 4 presents the results of the total variance explained analysis for the ROHSC construct. For Group 1, two factors were extracted with eigenvalues of 5.687 and 1.071, respectively. Together, they accounted for a cumulative variance of 84.480%, suggesting a strong and structured multidimensional interpretation of the construct. In Group 2, a single dominant factor with an eigenvalue of 3.180 explained 79.495% of the total variance, confirming a clear unidimensional construct. Then, Group 3 revealed one principal factor with an eigenvalue of 6.562, explaining 82.028% of the variance, again suggesting a coherent latent structure. Similarly, Group 4 showed a highly dominant factor (eigenvalue = 7.048) that accounted for 93.178% of the total variance, indicating extremely high internal consistency and factor clarity. Then, Group 5 followed this pattern, with a single factor explaining 95.208% of the variance (eigenvalue = 7.183), reinforcing the presence of a strong and single-dimensional factor. Across all five groups, the extracted factors explained between 79.495% and 95.208% of total variance. These results suggest that each group within the ROHSC construct demonstrates high internal coherence and strong one-dimensionality, confirming their structural integrity and suitability for further analysis.

Rotated Factor Matrix and Factor Loadings

The EFA adopted the Rotated Factor Matrix and retained the items concerning the minimal value of factor loading 0.60 for interpretation reasons (Hair et al., 2018). Items that did not meet this criterion or that were strongly cross-loaded across the dimensions were removed to enhance the robustness of the factor structure. Therefore, the data structure was improved by clustering the items close to their factors.

Table 4
Total variance explained for ROHSC groups

Construct	Factor	Initial Eigenvalues	Cumulative % of Variance
Group 1	1	5.687	
	2	1.071	84.480
Group 2	1	3.180	79.495
Group 3	1	6.562	82.028
Group 4	1	7.048	93.178
Group 5	1	7.183	95.208

This step was made to ensure that all items in the construct were clear and interpretable.

Rotated Factor Matrix for EFA Result on ROC Constructs

A rotated solution matrix derived from the EFA identified four main constructs of the ROC framework: perceived compatibility, informational assessment, motivation for change, and communication channels. The factor analysis employed principal factor analysis with Varimax rotation and Kaiser normalisation, with the factor loadings presented in Table 5, depicting the degree to which individual items loaded onto specific constructs.

Motivation for Change Construct.

The analysis of the construct Motivation for Change yielded a single predominant factor, indicating that all items within this construct consistently loaded onto one factor. This result suggests a high level of inter-item consistency and that the items collectively represent a coherent latent aspect of motivation. Such an outcome supports the theoretical argument that motivation for change is an unifactorial construction of organisational readiness for change, capturing the shared desire, enthusiasm, and cognitive readiness to engage in change within an organisational setting.

Informational Assessment Construct.

The analysis of the informational assessment construct identified two factors across 19 items, differing from the original three dimensions proposed in the theory. This finding aligns with Shea et al. (2014), which also focused on these two dimensions for measurement under the informational assessment construct. Following an examination of the characteristics of each item within the respective factors, and with reference to previous studies and ORC theory, the items were categorised and labelled as *task knowledge* and *resource availability*. Six items were eliminated due to factor loadings below 0.6, having fewer than three items (Awang et al., 2023), or exhibiting cross-loading (Hair et al., 2010). The discarded items were S2, RAV6, S3, S5, K3, and S1.

Table 5
Factor analysis results on ROC constructs

Label	Item	Factor			Removed Items
		1	2	3	
	Motivation for Change				
M5	We are confident that all employees in the organisation support the effort to obtain Halal certification.	0.949			
M6	We believe Halal certification will bring great benefits to our organisation.	0.940			
M4	We believe Halal certification is necessary to improve our organisation's performance.	0.924			
M3	We are not worried about the change towards Halal certification.	0.911			
M2	We see Halal certification as a positive change for our organisation.	0.821			
M1	We are confident that the organisation will be able to obtain Halal certification holder status.	0.717			
Extraction Method: Principal Factor Analysis Rotation Method: Varimax with Kaiser Normalisation One factor extracted					
Label	**Item**	**Factor**			**Removed Items**
		1	**2**	**3**	
	Informational Assessment				
K8	We understand the basic laws involved in Halal certification and the responsible authorities.	0.906			
K4	We know the roles and responsibilities of each employee in the process of obtaining Halal certification.	0.902			
K5	We understand the basic requirements that need to be complied with for food products in the context of Halal certification.	0.901			
K6	We know the procedures to follow to apply for Halal certification.	0.889			
K2	We know the finances needed to implement Halal certification.	0.841			
K7	We understand the needs relating to workforce adequacy.	0.740			
K1	We understand the length of time it takes to implement Halal certification.	0.662			
S4	To implement Halal certification compliance, organisations can monitor the progress of its implementation.	0.654			

Table 5 (*continued*)

RAV1	To implement Halal certification compliance, we have the necessary skills and knowledge to obtain Halal certification.	0.654			
S2	To implement Halal certification compliance, organisations can help employees adapt to these changes.	0.643	0.605		Removed
RAV5	To implement Halal certification compliance, we have enough manpower to implement Halal certification.		0.934		
RAV4	We have the facilities required to accomplish Halal certification compliance.		0.786		
RAV3	To implement Halal certification compliance, we have the necessary facilities to access the information.		0.666		
RAV2	To implement Halal certification compliance, we have enough time to implement Halal certification.		0.609		
RAV6	To implement Halal certification compliance, we have sufficient financial allocation to implement Halal certification.			-0.647	Removed
S3	Organisations can coordinate work to implement Halal certification compliance so that its implementation runs smoothly.				Removed
S5	Organisations can face challenges that may arise while implementing Halal certification compliance.				Removed
K3	We clearly understand the purpose of obtaining Halal certification for the benefit of our organisation.				Removed
S1	To implement Halal certification compliance, organisations can manage internal issues that arise while implementing this change.				Removed

Extraction Method: Principal Factor Analysis.
Rotation Method: Varimax with Kaiser Normalisation
Two factors extracted

Label	**Item**	**Factor**			**Removed Items**
		1	**2**	3	
	Perceived Compatibility				
C4	The cost of Halal certification such as certification and maintenance fees are reasonable and affordable for our company.	0.964			
C5	The timeframe for obtaining Halal certification, which is between 1 to 3 months, aligns with our company's expectations and planning.	0.960			

Table 5 (*continued*)

C1	Halal certification aligns with our company's work processes and operations.	0.884			
C2	Information about Halal certification is easily accessible and understandable by our organisation.	0.841			
C3	Organisations understand that the Halal certification compliance process is compatible with our organisation's existing quality control practices, including raw material control, hygiene, and safety.		0.996	Removed	
Extraction Method: Principal Factor Analysis. Rotation Method: Varimax with Kaiser Normalisation One factor extracted					
Label	**Item**	**Factor**			**Removed Items**
		1	**2**	**3**	
	Channel Communication				
RM3	The most TRUSTED source of early information to organisations regarding Halal compliance is through social media (e.g., Facebook, YouTube, TikTok, Instagram, Twitter).	0.827			
RM5	The most RELIABLE source in providing early information to organisations related to Halal compliance is indirect education (through exhibitions, expos, and Halal quiz).	0.801			
EM3	The most EFFECTIVE source in providing early information to organisations regarding Halal compliance is formal education such as workshops and Halal courses.	0.703			
RM2	The most RELIABLE source of initial information to organisations related to Halal compliance is through electronic media (such as television and radio).	0.679			
RM4	The most RELIABLE source of early information to organisations related to Halal compliance is through official government channels (e.g. portals, websites).	0.654			
EM2	The most EFFECTIVE source in providing initial information to organisations related to Halal compliance is electronic media (such as television and radio).		0.854		Removed
EM4	The most EFFECTIVE source for providing early information to organisations related to Halal compliance is through official government channels (such as portals, websites, and *Facebook Live*).		0.709		Removed

Table 5 (*continued*)

RM1	The most RELIABLE source of initial information to organisations related to Halal compliance is through print media (such as newspapers, magazines, and brochures).	0.842	Removed
EM1	The most EFFECTIVE source in providing initial information to organisations related to Halal compliance is print media (such as newspapers, magazines, and brochures).	0.803	Removed
Extraction Method: Principal Factor Analysis. Rotation Method: Varimax with Kaiser Normalisation Three factors extracted			

Perceived Compatibility Construct.

The *perceived compatibility* construct showed that four items (C4, C5, C1, and C2) loaded strongly onto Factor 1, with values ranging from 0.841 to 0.964. Item C3 loaded heavily onto Factor 2, with a value of 0.996. However, item C3 was removed from the analysis as it did not align with any meaningful factor or dimension (Hair et al., 2010).

Channel Communication Construct.

The Channel Communication construct analysis identified three distinct factors of the communication channels construct, focusing on items related to trusted and effective sources of information for Halal compliance. Factor 1 was defined by five items (RM3, RM5, EM3, RM2, RM4), strongly emphasising social media, direct and indirect education, and electronic media as the most trusted and effective channels. However, print media and some government channels were less clearly defined and thus removed from the final factor solution. Several items related to the effectiveness and trustworthiness of electronic and print media sources (e.g., EM2, EM4, RM1, and EM1) from Factor 2 and Factor 3 were removed because each factor retained only two items. It is generally recommended that each factor in a factor analysis ideally includes at least three items to ensure adequate construct representation and reliability (Ehido et al., 2020; Jani et al., 2023).

Rotated Factor Matrix for EFA Result on ROHSC Constructs

As shown in Table 6, the rotated factor matrix presents the results for the five groups under ROHSC. Group 1 identified two factors: "packaging and labelling" and "raw material control" under ROHSC. Specifically, item RBM3, originally linked to the first factor, was moved to the second factor after we realised its relevance only to raw material control based on the manual procedure for Malaysian Halal certification.

No items were removed during the analysis, indicating that all items meaningfully contributed to the factor structure. Next, Group 2 analysis reveals that four items strongly load onto a factor with values ranging from 0.837 to 0.934, with no items removed and renamed the "workers" factor. The same goes for group 3 with no removed item, the analysis revealed that eight items strongly loaded onto a factor, with values ranging from 0.881 to 0.926. The factor was renamed the "record management and Halal control system" as the fourth dimension of the ROHSC.

Group 4, which initially contained nine items, was extracted into four factors with strong factor loadings ranging from 0.637 to 0.853. However, only two factors were identified and selected, renamed as the "processing area" and "premises and facilities," each consisting of three items. Despite cross-loading in item RKP1, it was retained under the "premises and facilities" factor due to a higher loading value of 0.657 compared to 0.624. The decision to retain or remove items depends on the research objective and whether the items are essential for achieving the goals of the study (Piaw, 2014). If the items are considered important, they should be retained; otherwise, they should be removed. Three items (RKP5, KP1, and RKP2) were removed as factors requiring at least three items to be retained. Finally, Group 5 was extracted into two factors with nine items that loaded strongly, with values ranging from 0.833 to 0.950. However, the second factor, which contained only one item, was removed owing to cross-loading. The remaining factor was renamed as "storage and equipment".

In summary, the rotated factor matrix for the five groups under ROHSC identified seven factors/ dimensions. Group 1 identified two factors: "packaging and labelling" and "raw material control." Group 2 retained the "workers" dimension, while Group 3 formed the "record management and Halal control system" factor. Group 4 was split into two factors: "processing area" and "premises and facilities." Finally, Group 5 formed the "storage and equipment" factor. Overall, four items were removed, leaving 34 of the original 38 items.

Reliability Test: Cronbach's Alpha

To measure this latent construct, its internal validity was evaluated using the EFA results (Awang et al., 2023; Hair et al., 2019). Internal validity refers to the degree to which similar questions produce consistent results and accurately measure what they are intended to measure. A Cronbach's alpha coefficient greater than 0.70 is considered acceptable for internal consistency (Awang et al., 2023).

Table 7 reports the reliability findings for the constructs in ROC and ROHSC. The Cronbach's alpha coefficients for all constructs were excellent, exceeding 0.70 (Nunnally & Bernstein, 1994; Hair et al., 2019). Specifically, the analysis yielded a Cronbach's alpha of 0.920 for the 28 items under ROC and 0.988 for the 34 items under ROHSC. These results indicate excellent reliability and strong internal consistency

Table 6
Factor analysis result for ROHSC groups

Group 1		Factor				Removed Item	Rename Dimension
Label	**Item**	**1**	**2**	**3**	**4**		
RPP2	The organisation is ready to ensure that the labelling meets Malaysian Halal standards.	0.896					
RPP4	Organisations are willing to ensure that toxic packaging materials are not used.	0.875					Packaging and labelling
RPP1	The organisation is willing to ensure that the packaging illustration complies with Sharia.	0.868					
RPP3	The organisation is willing to ensure that the name of the product is not synonymous with non-Halal terms such as "ham" or "Bak Kut Teh".	0.865					
RBM3	The organisation is ready to ensure that the raw materials used match the raw material control records including the manufacturer's information such as name, address, and Halal certificate.	0.670				RBM3 realign to factor 2 (Raw Material Control)	
RBM1	Organisations are ready to ensure that critical raw materials used such as meat, poultry and gelatin have Halal certification.		0.900				
RBM2	The organisation is ready to ensure that the raw materials used are the same as those that will be declared to the authorities.		0.824				Raw Material Control
RBM4	The organisation is ready to ensure that illegal raw materials are not used.		0.808				

Extraction Method: Principal Factor Analysis.
Rotation Method: Varimax with Kaiser Normalisation. [A]

a. Rotation converged in 3 iterations.

Group 2		Factor				Removed Item	Rename Dimension
Label	**Item**	**1**	**2**	**3**	**4**		
RP4	The organisation is ready to ensure that all employees have a record of typhoid injection and a Food Handler Training Certificate.	0.934					
RP3	The organisation is willing to ensure that all employees practice hygiene, including frequent hand cleaning, wearing clean clothes, and following sanitation protocols.	0.922					Worker
RP1	The organisation is ready to ensure that all employees attend Halal awareness training.	0.869					
RP2	The organisation is ready to ensure that there are Muslim employees on duty in the processing area throughout the shift.	0.837					

Extraction Method: Principal Factor Analysis.

1 factor extracted.

Table 6 (*continued*)

Group 3		Factor				Removed Item	Rename Dimension
Label	**Item**	**1**	**2**	**3**	**4**		
SKH4	Organisations are ready to ensure that traceability control systems are implemented to identify the producers of each raw material.		0.926				
RDR3	Organisations are prepared to ensure that all raw material transaction documents, including invoices and receipts, are carefully recorded and well-kept.		0.923				
SKH2	The organisation is willing to ensure that the Halal policy is realised.		0.915				
RDR4	Organisations are prepared to ensure that product production records are documented.		0.912				
RDR1	Organisations are ready to keep Halal files in updated condition (e.g. ensuring all certifications, employee health records, and audit reports).		0.899				Record management and Halal control system
SKH1	The organisation is ready to ensure that the internal Halal control system manual is developed and implemented in writing.		0.897				
SKH3	The organisation is ready to ensure that the raw material control system is well implemented.		0.893				
RDR2	Organisations are ready to ensure that pest control activities are recorded.		0.881				

Extraction Method: Principal Factor Analysis.

a. 1 factors extracted.

Group 4		Factor				Removed Item	Rename Dimension
Label	**Item**	**1**	**2**	3	4		
RKP1	Organisations are ready to ensure that the processing area is free of dubious raw materials.	0.840				Removed	
RKP2	Organisations are ready to ensure that the processing area is free of dubious hardware.	0.820					
						Removed	
RKP4	The organisation is ready to ensure that the processing area is free of elements of worship such as religious symbols, worship statues, and religious ceremonial materials.		0.805				
RKP3	The organisation is ready to ensure that the processing area is always clean.		0.639				Processing area
RPK1	The organisation is ready to ensure the premises have basic facilities such as prayer rooms, toilets, pantries, and changing rooms.		0.637				

Table 6 (*continued*)

RPK3	The organisation is ready to ensure it is designed to prevent cross-contamination such as animals, cats, and pests.			0.704			
RPK4	The organisation is ready to ensure that ceilings, floors, walls, and windows are suitable, clean, and well maintained on an ongoing basis.			0.699			Premises and facilities
RPK2	The organisation is ready to ensure that the premises are not cross-contaminated with sewage plants, animal farms, and non-Halal premises.		0.624	0.657		0.657 taken	
RKP5	The organisation is ready to ensure that the processing area has control mechanisms for employees living inside the premises, such as periodic inspections and cleaning protocols according to Halal standards.				.853	Removed	

Extraction Method: Principal Factor Analysis.
Rotation Method: Varimax with Kaiser Normalisation.[a]

a. Rotation converged in 6 iterations.

Group 5	**Factor**					**Removed Item**	**Rename Dimension**
Label	**Item**	**1**	**2**	**3**	**4**		
RS1	The organisation is ready to ensure that there is no mixing of Halal and non-Halal ingredients by using separate storage and labelling.	0.950					Storage and Equipment
RS5	The organisation is ready to ensure that finished products and expired raw materials are disposed of from storage.	0.948					
RS4	The organisation is ready to ensure that raw materials are stored at the appropriate temperature, such as perishable goods below 5 °C.	0.942					
RA2	The organisation is ready to ensure that the equipment is cleaned after use.	0.930					
RS3	Organisations are willing to ensure that the storage of raw materials and ready products is segregated.	0.921					
RS2	Organisations are ready to ensure that finished products are stored with production date marking.	0.906					
RA4	The organisation is willing to ensure that the equipment is in a clean condition before use.	0.876					
RA1	Organisations are willing to ensure that animal-based equipment, such as bristle brushes, is not used.	0.833					
RA3	Organisations are prepared to ensure that equipment that can cause cross-contamination, such as rusty equipment, is not used.	0.705	0.666			Removed	

Extraction Method: Principal Factor Analysis.

a. 4 factors extracted.

Table 7
Reliability statistics for ROC and ROHSC variable

Emergent Constructs/ Factors	Cronbach's Alpha	N of Items
Motivation for change	0.938	6
Informational assessment	0.943	13
Perceived compatibility	0.929	4
Efficient channel communication	0.831	5
Total for ROC	0.920	28
Readiness organisation for Halal standard compliance (ROHSC)	0.988	34

for both instruments (Hair et al., 2021), confirming the robustness of the tools used in this research to proceed with the actual survey.

DISCUSSION

Following the EFA, the high factor loadings of each item indicated strong correlations with their respective factors, confirming the validity of the measurement. This validation confirms that the underlying factors are conceptually consistent with the theoretical domains proposed in Weiner's (2020) ORC model. Rather than being a purely statistical endeavour, this procedure served to provide an empirical separation of the core dimensions and to better refine the structure conceptually. Notably, items that failed to meet the minimum loading threshold or presented high cross-loadings were excluded to enhance the coherence and interpretability of the measurement model. This refinement improved the internal consistency of the remaining items, ensuring each one is conceptually relevant and consistent with the overall construct.

The second factor is informational assessment. Within this construction, two of the original three dimensions, task knowledge and resource availability, were retained, while the third dimension (situational) from ORC theory was excluded. Although Weiner's (2020) ORC model conceptualises situational factors as determinants of change efficacy, this study retained only task knowledge and resource availability. Situational factors, though theoretically relevant, did not emerge as a distinct factor in the context of this study and were thus excluded from the final model. This refinement, empirically supported by the EFA results, suggests that among SMiEs in Malaysia, readiness for Halal compliance is primarily determined by what organisations know about their tasks and the resources they possess, rather than by situational contingencies. However, this is not surprising, as previous studies have measured informational assessment using only two dimensions, task knowledge and resource availability (Hannon et al., 2020; Shea et al., 2014).

This finding reinforces Weiner's (2020) view that readiness is context-dependent and that the most salient aspects of change efficacy vary by organisational

size and environment. For SMiEs, practical knowledge and access to resources appear to be stronger determinants of readiness than broader situational factors. This result aligns with Jamai et al. (2022) and Md Nawi et al. (2023), who noted that resource adequacy often drives operational readiness in small firms.

Furthermore, several theoretically relevant items, such as organisational coordination, the ability to manage internal issues, and clarity of purpose, did not load significantly on any single factor and were therefore removed. This outcome suggests a disconnect between how situational readiness is conceptualised in theory and how it is experienced by SMiEs in practice. Unlike larger organisations, SMiEs often operate with minimal formal structures and limited resources, which may influence their perceptions of internal coordination and long-term strategic planning (Abd Rahman et al., 2017; Jamai et al., 2022; Md Nawi et al., 2023).

Furthermore, the analysis produced four distinct constructs that are consistent with the theoretical dimensions in the ORC and DOI models. In particular, the identification of four factors for ROC and seven for ROHSC reflects the readiness of Halal compliance among SMiEs. motivation for change and informational assessment represent the psychological readiness dimensions. Following this, perceived compatibility reflects the cognitive alignment between the Halal compliance and existing organisational practices. At the same time, efficient channel communication represents the structural communication processes that facilitate Halal compliance implementation. Collectively, these constructs illustrate how both psychological and structural factors interact to shape the overall readiness of SMiEs in adopting and maintaining Halal compliance.

This alignment reinforces that readiness among SMiEs operates as both a collective belief system and an operational capacity to act, which is consistent with Weiner's (2020) conceptualisation of ORC and supported by empirical validations such as Jo et al. (2023) and Shea et al. (2014). The findings further indicate that readiness for Halal compliance among SMiEs is shaped by the integration of psychological and structural dimensions, reflecting both the motivational drive to comply and the organisational mechanisms that enable implementation. This is consistent with Abd Rahman et al. (2017), who emphasised that perceived benefits and structural mechanisms such as traceability systems collectively enhance readiness for Halal assurance system implementation. Nevertheless, while SMiEs demonstrate positive intentions and awareness toward Halal compliance, the supporting structural and communication systems remain limited. This suggests a gap between their willingness to comply and their actual capacity to implement it effectively.

These insights emphasise the need for targeted interventions that enhance knowledge and motivation, strengthen communication channels, and integrate procedures to sustain Halal certification

readiness. Such an integrated perspective advances both ORC and DOI frameworks by demonstrating how belief systems and structural processes interact to shape organisational readiness within the Halal industry context.

In addition, the EFA for the ROHSC framework identified seven critical dimensions for assessing an organisation's readiness for Halal compliance. These dimensions include "packaging and labelling," "raw material control," "workers," "record management and Halal control system," "processing area," "premises and facilities," and "storage and equipment." The identified dimensions resonate with earlier work by Latif et al. (2014) and Arieftiara et al. (2022), who highlighted similar operational readiness areas as key determinants of Halal compliance success. Interestingly, the empirical separation of raw material control and packaging into distinct factors suggests that respondents do not perceive these as part of a unified process. This likely reflects the operational reality in SMiEs, where packaging is treated as a final-stage activity rather than an extension of material control. Such findings highlight the importance of adapting theoretical models to fit sector-specific practices. Additionally, the RBM3 item (firm is ready to verify that all raw materials align with control records) was reassigned from the packaging dimension to raw material control, based on a clearer conceptual alignment in line with the Malaysian Halal certification manual. This finding extends ORC's applicability beyond behavioural change into operational domains, indicating how structural readiness complements psychological readiness in the Halal context. This reassignment highlights how EFA helps ensure that the constructs are statistically assessed and conceptually grounded in the operational realities and target populations. Overall, out of the 38 items in the ROHSC construct, four were removed due to weak loadings or cross-loadings, leaving 34 items for further analysis.

After analysing the complete set of variables (ROC and ROHSC), the framework was refined by removing 15 items, resulting in 62 items out of the original 77. This streamlined structure provides a comprehensive tool for evaluating organisational readiness for compliance with Halal standards. The EFA highlights emergent factors with high Cronbach's alpha values (0.965-0.988), enhancing the understanding of factors influencing ROC and ROHSC.

The validated ROC and ROHSC frameworks from this study offer a practical tool for assessing Halal compliance readiness among SMiEs. This operationalisation demonstrates how the ROC framework can be translated into measurable dimensions for Halal compliance, bridging the gap between theoretical readiness constructs and practical assessment tools. Beyond self-assessment, agencies such as training providers can also use this instrument to better determine SMiEs' readiness for Halal standard compliance. These findings also have implications for authorities and Halal promoters' agencies such as JAKIM and Halal Development Corporation. The emergence of constructs such as "efficient

channel communication" highlights the role of not just technical readiness but also the clarity and reliability of communication throughout the certification process.

While this study offers a solid empirical foundation for understanding readiness for Halal compliance, several limitations must be acknowledged. First, the exclusion of certain dimensions, such as situational factors, may reflect context-specific constraints rather than their true irrelevance. Future research should further explore these dimensions using new items. Second, this study is limited to the exploratory stage, as the data were drawn from a pilot study and only subjected to EFA.

CONCLUSION

This study developed and validated a measurement instrument for assessing organisational readiness for Halal compliance among SMiEs in Malaysia. The study details the survey questionnaire development process, including pretest and pilot study stages, to ensure its validity and reliability. EFA was conducted to identify key factors influencing readiness, revealing the underlying structures related to ROC and ROHSC. The results highlight distinct factors, each explaining significant variance and enhancing the understanding of organisational readiness for change and Halal compliance.

In conclusion, the identified factors align well with the objectives of the study and findings from the EFA offer valuable insights into the critical constructs of ROC and ROHSC. The validated framework can guide SMiEs owners and relevant authorities in diagnosing readiness gaps and designing targeted interventions to improve Halal compliance. Future research should expand on this work through confirmatory factor analysis and application in broader Halal-related industry contexts.

Ethics Review Board Clearance

This study complied with the ethical guidelines and was approved by the Universiti Putra Malaysia Ethics Committee (reference number JKEUPM-2024-663).

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