

USING INTERNAL MONITORING DATA TO IDENTIFY HALAL COMPLIANCE RISK PATTERNS IN HOTEL OPERATIONS: EVIDENCE FROM FOUR CLUSTER PROPERTIES IN MALAYSIA

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Abstract: The effectiveness of halal compliance systems in hospitality operations depends on regulatory frameworks and internal monitoring practices within organisations. However, empirical evidence on how internal governance data can be used to identify operational risk patterns in halal compliance remains limited. Accordingly, this study examines internal monitoring data from four hotel properties in Malaysia known as Hotel 1 (H1), Hotel 2 (H2), Hotel 3 (H3), and Hotel 4 (H4) over the period January to December 2025 to identify key compliance risk areas. The study utilises organisational records on halal training participation, internal audit findings, and ingredient control observations to construct a descriptive risk profile across four properties. Rather than testing causal relationships, the analysis adopts an exploratory descriptive approach to examine patterns and variations in compliance performance. As such, a Halal Compliance Dashboard Framework (HCD-F) is proposed as a pilot tool to facilitate comparative assessment across operational units. Although no composite score is calculated, the framework is presented for illustrative purposes. The findings indicate that ingredient control remains the most critical risk area, with undeclared ingredient observations consistently recorded across all four properties (198 observations in total). Internal audit findings further highlight documentation and procedural non-compliance as recurring issues. Additionally, training participation varies across properties, ranging from 17 to 114 participants, suggesting differences in internal capacity-building efforts. The results also suggest a pattern where properties with higher observation counts may operate under more rigorous internal monitoring. Still, this remains an exploratory observation rather than a conclusive finding. Overall, this study contributes to the literature by demonstrating how internal organisational data can be operationalised to identify halal compliance risk patterns in hospitality settings. The findings also have practical implications

for halal governance, supporting data-driven monitoring and continuous improvement strategies at the operational level.

Keywords: Halal hospitality, halal compliance, halal assurance system, hotel management, halal governance, audit monitoring

1. Introduction

The global halal industry has experienced substantial growth in recent years, driven by increasing demand from Muslim consumers and the expansion of Muslim-friendly tourism (R. Hakim et al., 2025). In the hospitality sector, halal certification is critical to ensuring that food preparation processes, ingredients, and operational procedures comply with Islamic dietary requirements (R. Hakim et al., 2025). Meanwhile, for hotels operating in Muslim-majority countries and halal tourism destinations, maintaining halal certification has become both a regulatory obligation and a competitive advantage (Info, 2025).

While halal certification frameworks provide guidelines for compliance, the operational implementation of Halal Assurance Systems (HAS) within hospitality environments remains complex. Notably, hotel kitchens involve multiple operational processes, including ingredient procurement, food preparation, menu development, and service delivery (Razalli et al., 2025). In particular, these processes require consistent monitoring to ensure that halal integrity is maintained throughout the supply chain and operational workflow.

Previous studies on halal hospitality have primarily focused on consumer perceptions, halal tourism demand, and marketing strategies. Despite this, limited research has examined the internal operational mechanisms that support halal compliance within hospitality organisations (Iman & Mohd, 2020). Moreover, there is a lack of empirical studies analysing how hotels manage training programmes, ingredient verification processes, and audit monitoring systems to ensure continuous halal compliance (Abdullah et al., 2025; Hashim & Fauzi, 2025).

To address this gap, this study examines operational practices for halal compliance across four halal-certified hotels operating under a cluster management structure in Malaysia. The research evaluates organisational performance using operational data from training activities, ingredient declaration management, internal audits, and external regulatory audits collected during the period January to December 2025. Thus, by analysing these indicators, the study seeks to understand how halal assurance practices are implemented in real operational environments.

Furthermore, this study introduces the **Halal Compliance Dashboard Framework (HCD-F)** as an exploratory composite measurement framework designed to evaluate halal governance performance in hospitality organisations. Accordingly, the HCD-F integrates three operational dimensions, training competency, ingredient control, and audit monitoring, to provide a systematic evaluation of halal compliance effectiveness. It is presented as a pilot dashboard tool requiring further validation.

The objectives of this study are therefore threefold:

1. To analyse halal compliance operational practices in hospitality organisations.
2. To evaluate training, ingredient control, and audit monitoring indicators across multiple hotel properties
3. To propose an HCD-F for comparative assessment of halal governance performance in hotel operations.

Therefore, by providing empirical insights into halal compliance practices, this study contributes to both halal management literature and hospitality operations research.

2. Literature Review

2.1 Halal Hospitality and the Halal Tourism Industry

Halal hospitality refers to services that comply with Islamic principles, particularly in food preparation, ingredient sourcing, and operational procedures. As Muslim travel grows globally, hotels increasingly adopt halal-friendly practices (A. A. Hakim et al., 2017). In line with this, previous studies indicate that halal certification enhances consumer trust and brand reputation in Muslim-friendly tourism markets, though maintaining certification requires structured internal compliance systems (Razalli et al., 2025). While certification enhances consumer trust (Gresik, 2026), the practical implementation of these standards within complex hotel environments remains heavily dependent on the operational frameworks that hotels choose to adopt, namely the Halal Assurance System (HAS).

2.2 Halal Assurance Systems in Food Service Operations

The HAS provides a structured framework for maintaining consistent halal compliance, requiring organisations to establish policies, documentation, procedures, monitoring systems, and internal audit mechanisms (JAKIM, 2020b). Within hospitality operations, effective HAS implementation depends on organisational commitment and staff awareness. Without adequate training and monitoring, operational risks such as cross-contamination, undocumented ingredients, and procedural non-compliance may occur (Abdullah et al., 2025). However, the HAS framework is only as effective as the human element executing it. Given that (JAKIM, 2020b) mandates structured policies and monitoring, the critical question shifts from what the system requires to how staff are equipped to fulfill these requirements making training and competency the primary drivers of successful HAS implementation (Ricciardi, 2005).

2.3 Training and Competency in Halal Management

Staff training is widely recognised as critical for ensuring halal compliance in food service organisations (Hashim & Fauzi, 2025). Specifically, halal awareness training programmes aim to improve staff understanding of halal principles, increase awareness of cross-contamination risks, ensure proper documentation procedures, and strengthen organisational compliance culture. Following this, studies have demonstrated that organisations with structured training programmes exhibit higher operational compliance and lower audit non-conformities (Ab Talib et al., 2016). While structured training improves compliance culture, its impact is ultimately constrained by the tangible operational realities of the kitchen. Specifically, even well-trained staff cannot ensure compliance if the supply chain and integrated verification processes are fragmented, highlighting that training must operate in tandem with rigorous internal monitoring and ingredient control mechanisms (Rinawati et al., 2026).

2.4 Ingredient Control and Internal Audit Monitoring

Ingredient verification represents one of the most significant operational challenges in halal compliance. Hotels often use hundreds of ingredients from multiple suppliers, making documentation and verification complex (Razalli et al., 2025). For example, key risks include undeclared ingredients, expired halal certificates from suppliers, and unapproved ingredient substitutions. Meanwhile, internal halal audits serve as an essential mechanism for identifying

operational gaps before regulatory inspections occur (R. Ali et al., 2017). Similarly, internal monitoring typically includes kitchen inspections, documentation reviews, and ingredient verification checks. In essence, organisations with proactive internal monitoring systems often demonstrate better audit performance during external regulatory assessments (Elizabeth et al., 2021).

Although previous studies have recognised the importance of training, ingredient verification, and internal auditing in HAS, most investigations have focused on certification requirements, consumer perceptions, or halal supply chain structures. At the same time, limited attention has been given to how internal operational monitoring data can be utilised as a governance mechanism to identify compliance risks within hospitality organisations (van der Spiegel et al., 2012). Furthermore, existing studies often examine halal compliance from a regulatory perspective rather than from an organisational performance perspective (Syed Hamzah et al., 2024). Consequently, there remains insufficient empirical evidence on how routine operational records, such as audit findings, training participation, and ingredient control observations, can be transformed into actionable indicators for continuous halal governance improvement. This gap is particularly evident within hotel operations, where operational complexity and frequent menu changes increase compliance risks.

Organisations with proactive internal monitoring exhibit better external audit performance (Sem & Hastuti, 2024). However, a critical oversight persists in the current literature: while the existence of training, ingredients checks, and audits is well-documented, there is a distinct lack of empirical analysis on how the routine operational data generated by these activities (e.g., daily audit logs, training attendance records) can be retrospectively analysed to predict and prevent compliance failures. This represents a missed opportunity to transform compliance from a reactive regulatory obligation into a proactive governance tool.

2.5 Research Gap

Consequently, while existing scholarship has thoroughly mapped the structural requirements of HAS, certification frameworks, and supply chain logistics (Ab Talib et al., 2015; Hashim & Fauzi, 2025; Hasma et al., 2024), it has largely ignored the diagnostic potential of internal monitoring data. This study addresses this void by shifting the analytical lens from what hotels should do to what operational risk patterns emerge from their internal records, thereby providing an evidence-based approach to continuous halal governance improvement in the high-risk, high-variety environment of hotel food service.

3. Conceptual & Analytical Framework

This study is grounded in internal control and compliance governance perspectives, which emphasise the role of organisational monitoring systems in ensuring adherence to established standards (Assessment & Activities, 2013; Power, 1999). In halal management systems, compliance is not achieved solely through external certification. Rather, it can be achieved through continuous internal verification processes, including training, documentation control, and internal audits (JAKIM, 2020b).

The conceptual relationship between these elements is illustrated below:

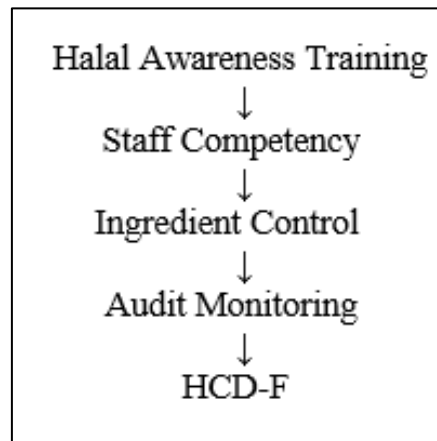


Figure 1. Conceptual Framework

In this context, internal monitoring data serve as a critical mechanism for identifying operational risk patterns. Prior studies in quality management and food safety systems have demonstrated that internal audit findings and process deviations provide early indicators of systemic weaknesses (Elizabeth et al., 2021; Talib & Hamid, 2015). Despite this, the application of such data-driven approaches remains underexplored in halal hospitality operations.

In particular, this study focuses on how existing internal monitoring practices can be systematically analysed to reveal patterns of compliance risk, responding to calls in the literature for more operational-level evidence to complement conceptual discussions on halal management systems (M. H. Ali et al., 2017; Talib & Johan, 2012).

4. Methodology

This study adopts an exploratory case-based design using internal halal monitoring data from four hotel properties under a single management cluster in Malaysia. The analysis is strictly limited to records from January to December 2025 to ensure temporal consistency and data comparability. Data spanning the full calendar year were extracted and analysed retrospectively in 2026, ensuring a complete annual dataset.

The dataset comprises three components.

- (1) Halal training participation records,
- (2) Internal audit findings, and
- (3) Ingredient control monitoring data.

These were extracted from the organisation's internal halal tracking system. The unit of analysis is the individual hotel property ($n = 4$). Given the small sample size, the study employs descriptive and comparative analysis rather than inferential statistical techniques. The objective is to identify observable compliance risk patterns rather than to test causal relationships.

4.1 Research Design

This study adopts a **case-based empirical analysis** using organisational operational data collected from four halal-certified hotels. The dataset includes monitoring indicators recorded within the organisation's HCD for the year 2025. The four properties were selected as they operate under the same cluster management structure, share the same halal certification body, and maintain complete monitoring records for the full 2025 reporting period. In addition, purposive sampling was employed to select properties that (a) held valid halal certification

from JAKIM, (b) operated under the same cluster management to ensure comparable monitoring procedures, and (c) had complete internal monitoring records for the entire 2025 period. Meanwhile, properties with incomplete or missing records were excluded.

4.2 Data Collection

The dataset includes operational indicators from four hotel properties:

- Halal awareness training programmes
- Ingredient declaration submissions
- Internal halal audit observations
- External audit findings

These indicators were analysed to evaluate operational performance and identify compliance trends.

4.3 Development of Halal Compliance Dashboard Framework (HCD-F)

To support internal comparative monitoring, this study proposes a pilot HCD-F. Notably, the framework integrates three operational dimensions, training coverage, ingredient control, and audit-related compliance observations, and is presented for illustrative comparative assessment. Note that no composite score is calculated in this study.

Given the exploratory nature of this study and the small number of cases, equal weighting is applied across the three dimensions to avoid introducing unvalidated assumptions regarding the relative importance of each component. Accordingly, the HCD-F should be interpreted as an indicative internal monitoring framework designed to support comparative assessment across properties.

4.4 Data Analysis Techniques

4.4.1 Descriptive Analysis

Descriptive statistics (frequencies, totals, and percentages) were used to summarise training participation, ingredient declaration submissions, and internal audit findings across the four properties as shown in Table 1.

Table 1. Descriptive summary of halal monitoring indicators by hotel property (January–December 2025)

Indicator	H4	H1	H2	H3
Training sessions conducted	3	9	4	8
Training participants	17	38	62	114
Total employees	83	166	235	122
Training coverage (%)	20.5%	22.9%	26.4%	93.4%
Total menu items	403	1358	409	245
Additional Menu Submission	2	3	2	1
Additional Ingredients Letter Submission	4	12	18	8
Additional Ingredients Submitted (items)	125	114	168	248
GMP observations	100	87	178	66
Documentation issues	14	7	6	38

4.4.2 Comparative Analysis

Due to the small sample size ($n = 4$), inferential statistical techniques such as correlation analysis are not appropriate. Instead, comparative descriptive analysis is used to identify patterns across properties. For example, properties are ranked by training participation, ingredient control observations, and audit findings to explore potential relationships. These comparisons are presented as exploratory observations requiring confirmation with larger datasets.

4.5 Data Verification

To ensure data reliability, the following verification procedures were applied:

- Training records were cross-referenced with attendance sheets and Human Resource (HR) records to confirm participant names and employee status.
- Ingredient declaration data were verified against internal audit checklists and, where available, supplier documentation.
- Internal audit findings were reviewed by the cluster halal committee to confirm that observations were consistently categorised across properties.
- Data entry accuracy was examined by comparing dashboard extracts with original audit reports for a 10% random sample of records; no discrepancies were reported.

All data were extracted directly from the organisation's internal halal tracking system, maintained by the cluster halal committee and updated in real time during audit activities.

4.6 Data Trustworthiness

Internal monitoring data are subject to potential reporting bias, as properties with more rigorous monitoring may report more observations. However, the following factors support data trustworthiness:

- Standardised reporting formats were used across all four properties.
- Audit categorisation (minor vs. major non-compliance) was consistently applied in accordance with JAKIM guidelines.

- External regulatory audit results (14 minor findings, zero major non-conformities) provide convergent validation, confirming that internal monitoring data align with independent external assessments.
- The pattern across properties is interpretable: H3, which had the highest training coverage (93.4%), also had the lowest undeclared ingredient observations (34), demonstrating internal consistency between operational indicators.

5. Results

5.1 Descriptive Overview of Halal Monitoring Data (2025)

The analysis is based on internal halal monitoring data collected from four hotel properties for the period January to December 2025. A total of 24 halal-related training sessions were conducted, involving 231 participants from a total workforce of 576 employees, for an overall training coverage of approximately 40.1%. In addition, 50 staff were identified as pending training at the end of the reporting period. Table 2 presents the training and simulation activities conducted across the four hotel properties during January to December 2025, including mock sertu exercise, mock recall exercises, training sessions, and practicap numbers.

Table 2. Training and simulation exercises across four properties (January–December 2025)

Hotel	Mock Sertu Exercise	Mock Product Recall	Training Sessions	Participants
H4	31 July 2025	14 February 2025	3	17
H1	1 July 2025	29 April 2025	9	38
H2	17 January 2025	24 April 2025	4	62
H3	31 July 2025	20 February 2025	8	114
Total			24	231

Note: "Sertu" refers to Islamic ritual cleansing required for severe impurity (najis mughallazah) under Malaysian halal certification procedures.

These figures indicate a moderate level of training implementation across the properties, though coverage gaps remain. The presence of pending training cases suggests that competency development is still ongoing and may vary across operational units. In particular, H3 recorded the highest participation (114 participants), suggesting strong training engagement and awareness levels among staff.

5.2 Ingredient Control Observations

Ingredient control monitoring reveals a high frequency of undeclared ingredient observations across all properties. Multiple inspection cycles throughout 2025 recorded recurring cases of undeclared or unverified ingredients, indicating that supplier verification and documentation processes remain key areas of concern. Table 3 summarises ingredient declaration management across the four hotel properties, covering total menu items, additional menu submissions, ingredient submission letters, and number of additional ingredients submitted during the study period.

Table 3. Ingredient declaration management across four properties (January–December 2025)

Hotel	Total Menu Items	Additional Menu Submissions	Additional Ingredients Submission Letters	Additional Ingredients Submitted
H4	403	2	4	125
H1	1358	3	12	114
H2	409	2	18	168
H3	245	1	8	248
Total	2415	8	42	655

The persistence of such observations across different time periods suggests that the issue is not isolated to specific incidents. Rather, it reflects broader challenges in maintaining supply chain integrity within hotel operations. For instance, inspection records indicate repeated undeclared ingredient observations across multiple reporting dates in 2025.

5.3 Internal Audit Findings

Internal audit results indicate that most non-compliance cases fall into the minor category, with few major or serious findings. Following this, common issues identified include documentation gaps and procedural inconsistencies. Table 4 presents the internal audit findings across the four hotel properties, comprising GMP observations, undeclared ingredient items, and documentation issues recorded during January to December 2025.

Table 4. Internal audit findings across four hotel properties (January–December 2025)

Hotel	GMP Observations	Undeclared Items	Documentation Issues
H4	100	43	14
H1	87	71	7
H2	178	50	6
H3	66	34	38
Total	431	198	65

Note: GMP refers to Good Manufacturing Practices, including hygiene, food safety, and product handling procedures.

While the absence of serious non-compliance suggests that the overall halal assurance framework is operational, recurring minor findings highlight the need for improved administrative controls and the standardisation of procedures across departments. Ingredient control observations (198 cases) accounted for 28.6% of all recorded operational observations, exceeding documentation issues (65 cases). This, in turn, highlights ingredient governance as the dominant halal compliance risk across the participating hotels.

5.4 GMP and Operational Observations

Observations related to Good Manufacturing Practices (GMP), including hygiene, food safety, and product handling, were consistently recorded across all properties. The volume of GMP-related observations indicates variability in operational practices and adherence to standard procedures at the execution level.

Generally, these findings suggest that operational discipline, particularly in food preparation and handling processes, remains a critical area requiring continuous monitoring and reinforcement.

5.5 Compliance Risk Patterns Across Properties

Based on the 2025 internal monitoring dataset, several notable patterns in halal compliance emerge across the four properties. First, ingredient control observations consistently represent the most prominent category of non-compliance. Undeclared ingredient cases were observed across all properties, indicating that supply chain verification remains a critical risk area. Second, internal audit findings highlight recurring issues related to documentation and procedural compliance. These findings suggest that, beyond ingredient verification, administrative control mechanisms require strengthening. Third, variations in training participation are observed across properties. Overall, the findings indicate that internal monitoring data provide valuable insights into operational risk patterns, particularly when interpreted in relation to monitoring intensity and organisational practices.

6. Proposed Halal Compliance Dashboard Framework (HCD-F)

Rather than generating a composite index score, this study proposes an HCD-F as a visual tool for internal monitoring. The framework integrates three operational dimensions: training participation, ingredient control, and audit monitoring. It is particularly intended for comparative assessment across properties without reducing performance to a single numerical score as shown in Figure 2.

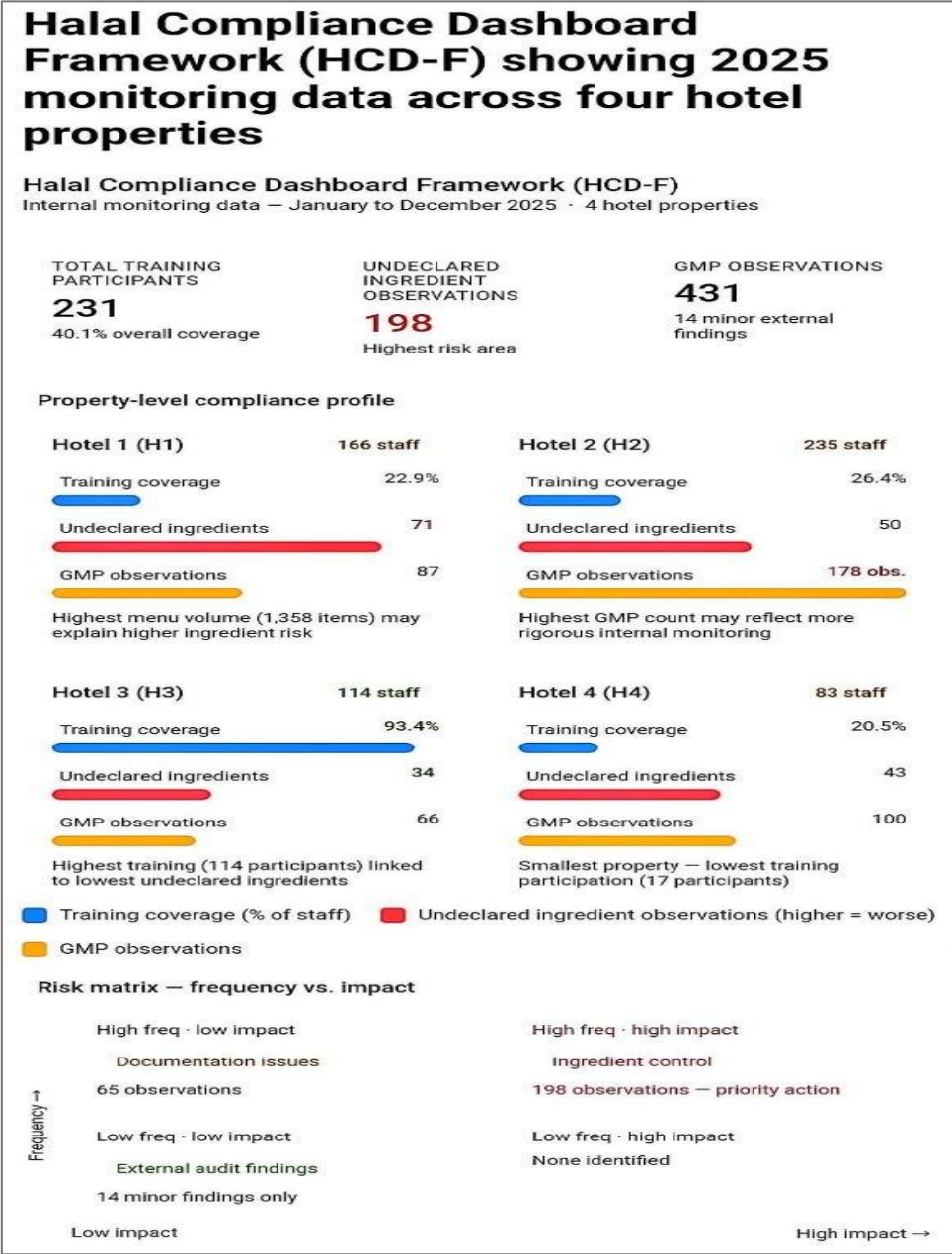


Figure 2: Introduction to HCD-F

The top row shows the three key numbers at a glance consist of overall training coverage, total undeclared ingredient observations (the red number, the highest-risk area), and GMP observations. The four hotel cards each show the same three dimensions side by side as progress bars, so you can compare across properties instantly. H3 stands out immediately as its training bar is almost full (93.4%) and its ingredient risk bar is the shortest. H1 has the longest ingredient risk bar because of its 1,358 menu items. The risk matrix at the bottom visually represents the findings presented in Table 7, where ingredient control is positioned in the high-frequency, high-impact quadrant.

6.1 Dashboard Dimensions

Table 5 outlines the three operational dimensions incorporated into the HCD-F, together with their respective indicators and internal data sources used for monitoring halal compliance performance.

Table 5. Dashboard Dimension

Dimension	Indicator	Data Source
Training competency	Percentage of staff trained	Training participation records
Ingredient control	Number of undeclared ingredient observations	Internal audit findings
Audit monitoring	Number of GMP and documentation observations	Internal audit reports

6.2 Illustrative Application

Using the 2025 dataset, the dashboard reveals the following patterns:

- Training: H3 recorded the highest training participation (114 participants), while H4 recorded the lowest (17 participants).
- Ingredient control: H1 recorded the highest number of undeclared ingredient observations (71), while H3 recorded the lowest (34).
- Audit monitoring: H2 recorded the highest GMP observations (178), while H3 recorded the lowest (66).

These variations suggest that no single property excels across all dimensions. H3, for example, performed well in training and ingredient control, though it recorded moderate documentation issues (38 observations). This reinforces the need for multi-indicator monitoring rather than reliance on any single metric.

6.3 Limitations of the Dashboard Approach

The HCD-F is presented as an exploratory framework requiring further validation. Due to the small sample size ($n = 4$) and the absence of a statistically validated weighting scheme, no composite index score is calculated in this study. Notably, the framework is intended as a practical internal governance tool for comparative assessment, not as a validated measurement instrument. Thus, future research may develop weighted scoring models using larger datasets and expert validation.

7. Discussion

The findings confirm that halal governance in hotel operations depends on structured internal monitoring systems, staff competency, and ingredient control mechanisms.

One of the most significant observations relates to internal audit monitoring. While internal audits identified multiple operational observations across the properties, external regulatory audits reported relatively low levels of non-conformities. This suggests that internal monitoring mechanisms function effectively as preventive control systems, enabling organisations to address operational issues before they escalate into regulatory non-compliance. However, higher levels of detected non-compliance do not necessarily correspond to weaker performance. In some cases, properties with higher observation counts may reflect more rigorous internal monitoring practices.

Building on this, ingredient declaration management emerged as a critical operational challenge. Hotels operate complex foodservice environments with numerous menu items and

ingredient variations. Hence, ensuring that every ingredient used in recipes is properly declared and documented requires continuous coordination between kitchen operations, purchasing departments, and halal management teams. The 198 undeclared ingredient observations across the four properties highlight that this remains a persistent risk.

Training activities also play a crucial role in strengthening compliance culture. Properties with higher training participation appeared to show more favourable compliance indicators, though this pattern cannot be confirmed with only four cases. Nevertheless, given the exploratory descriptive nature of this study, no causal relationship can be established. H3, which recorded the highest training participation (114 participants), also demonstrated stronger ingredient control (34 undeclared observations, the lowest among the four properties). This supports previous research by Ab Talib et al. (2016) and Hashim and Fauzi (2025), who revealed that structured training programmes are associated with lower audit non-conformities in halal-certified food operations.

On a similar note, an important analytical consideration is the direction of interpretation. Properties with higher observation counts, such as H1 (71 undeclared ingredients), could be interpreted as weaker performers. However, an alternative interpretation is that H1's internal monitoring may be more rigorous, leading to higher detection rates. This distinction has practical implications: managers should not simply reduce observation counts. Instead, they should evaluate whether low counts reflect genuine compliance or weak monitoring. The convergent evidence from external audits (zero major non-conformities) supports the latter interpretation for some properties, though causal claims cannot be made with $n = 4$. Second, the relationship between training and compliance is not uniformly linear. While H3's high training coverage (93.4%) correlated with strong ingredient control (34 undeclared observations), H1's moderate training coverage (22.9%) was associated with the highest undeclared observations (71). Yet, H1 also had the highest total menu items (1,358), suggesting that operational scale may moderate the effectiveness of training. This implies that training intensity may need to be calibrated to kitchen complexity, a hypothesis for future research.

Beyond individual operational factors, a structured approach is needed to integrate these indicators for comparative monitoring. Accordingly, the proposed HCD-F provides a useful structure for integrating training, ingredient control, and audit monitoring indicators into a comparative monitoring model. As an exploratory tool, it offers a practical approach for internal governance without overclaiming statistical validity. This suggests that halal compliance performance should be interpreted in the context of operational complexity rather than solely in terms of absolute observation counts.

7.1 Operational Risk Mapping

To further interpret the empirical findings, an operational risk mapping analysis was conducted to identify the primary areas of halal compliance risk within hotel operations. Interestingly, risk mapping allows organisations to visualise where operational weaknesses occur and prioritise corrective actions accordingly.

In hospitality environments, halal compliance risks typically arise from three operational domains: **staff competency**, **ingredient governance**, and **operational monitoring**. These domains correspond closely with the indicators used in the HCD-F introduced in Table 6 below.

7.2 Operational Risk Mapping in Halal Hotel Compliance

Table 6. Operational risk areas, evidence, and risk levels

Risk Area	Operational Issue	Evidence from Data	Risk Level
Training Competency	Limited participation in halal awareness training	Lower training participation observed in some hotels	Medium
Ingredient Control	Undeclared ingredients and incomplete documentation	198 undeclared ingredient observations recorded during internal audits	High
Documentation Management	Inconsistent documentation control	65 documentation findings during internal audits	Medium
Operational Monitoring	Variation in internal audit intensity across hotels	Differences in GMP observations between properties	Medium
External Compliance	Minor findings during regulatory audits	14 minor findings across four hotels	Low

Note: Risk level is based on frequency of observations and potential impact on halal certification. High = recurring observations across multiple properties with potential certification risk; Medium = occasional observations with low certification risk; Low = rare observations with minimal certification risk.

The risk mapping analysis indicates that **ingredient control represents the most significant operational risk area** in halal hotel management. The relatively high number of undeclared ingredient observations during internal monitoring suggests that ingredient verification processes require continuous attention.

Documentation management also presents a moderate operational risk. In hospitality environments where menu items frequently change and multiple suppliers are involved, maintaining updated halal documentation can be challenging. Without systematic documentation control procedures, hotels may experience compliance gaps during regulatory audits.

Likewise, training participation emerged as another important operational factor. Hotels with higher levels of training participation demonstrated stronger compliance indicators across multiple operational dimensions. This finding supports previous research suggesting that staff competency is critical for effective HAS implementation. Despite the internal operational observations recorded during monitoring activities, external audit results indicate that the participating hotels successfully maintained overall compliance with halal certification requirements. On the other hand, the absence of serious or major non-conformities indicates that internal monitoring mechanisms are functioning effectively as preventive compliance controls.

The risk areas identified in this section align with the three dimensions of the HCD-F: training competency, ingredient control, and audit monitoring. This alignment suggests that the HCD-F captures the primary operational risks in halal hotel compliance. Furthermore, the operational risk mapping highlights that halal compliance in hospitality environments depends heavily on proactive internal governance mechanisms. Rather than relying solely on external regulatory audits, hotels must continuously monitor operational processes through structured training programmes, ingredient verification procedures, and internal audit systems.

For hotel management, the findings suggest that strengthening ingredient traceability systems and staff competency programmes can significantly reduce compliance risks and improve halal governance performance. Similarly, cluster-level halal management structures may enhance compliance performance by standardising monitoring practices across multiple properties and facilitating knowledge sharing between hotel teams.

7.3 Halal Compliance Operational Risk Map

Table 7. Halal compliance operational risk map (2x2 matrix)

	Low Impact (Minor Issues)	High Impact (Certification Risk)
High Frequency	Documentation issues (65 observations)	Ingredient Control (198 observations)
Low Frequency	External audit findings (14 minor findings)	(None identified)

The findings presented in Table 7 position ingredient control as the highest-priority area for managerial attention because it combines a high frequency of observations with significant potential certification risk. Documentation issues are also classified as high frequency but carry a comparatively lower certification impact, suggesting that they may be addressed primarily through improvements in administrative and documentation controls.

8. Contribution

This study contributes to the literature by demonstrating how internal organisational monitoring data can be systematically used to identify patterns of halal compliance risk in hospitality operations. Rather than proposing a new theoretical model, the study provides an evidence-based governance perspective that complements existing conceptual discussions on halal management systems. Additionally, the operational risk mapping (Section 8) provides hotels with a practical tool to visualise and prioritise compliance risks, particularly ingredient control, which is the highest-risk area. In practice, the study introduces a pilot dashboard approach (HCD-F) to support data-driven monitoring and continuous improvement in hotel operations. Unlike previous halal hospitality studies that primarily rely on perception-based surveys or conceptual discussions, this study utilises actual organisational monitoring records. It comprises training participation data, ingredient control observations, and internal audit findings collected across four halal-certified hotel properties.

Building on this, the study demonstrates how routinely collected operational data can be transformed into a practical risk-monitoring mechanism to support halal governance and continuous improvement. This evidence-based approach provides a valuable contribution to the emerging literature on data-driven HAS within hospitality operations. The study also contributes to the emerging literature on halal governance by providing evidence from a cluster-level management structure. Unlike studies focusing on single organisations, the present research demonstrates how standardised monitoring procedures across multiple hotel properties can facilitate benchmarking, knowledge sharing, and coordinated compliance improvement efforts. This ultimately highlights the potential value of cluster-based halal governance models in strengthening organisational compliance performance.

9. Limitation

This study is subject to several limitations. First, the analysis is based on a small sample of four hotel properties, limiting generalisability to other hospitality contexts. Second, the use of internal organisational data may introduce reporting bias, as higher observation counts may reflect stronger monitoring intensity rather than weaker compliance. Third, the HCD-F is a pilot framework and has not been statistically validated; no composite scoring is presented. In response, future research should expand the dataset, apply more robust analytical techniques, and develop validated weighting methods for the dashboard framework.

10. Practical Implication and Policy Recommendations

The following recommendations are derived from the 2025 monitoring data and align with existing Malaysian halal certification requirements.

10.1 Hotel Management

The findings of this study highlight several critical areas requiring managerial attention to ensure compliance with the Manual Procedure for Malaysia Halal Certification (MPPHM) 2019 and the Malaysia Halal Management System (MHMS) 2020.

Firstly, the observed association between training participation and compliance indicators underscores the significance of competency development as emphasised in **MHMS 2020 (Clause 4.2: Competency, Training and Awareness)**. It mandates that all personnel involved in halal-critical processes must be adequately trained. In practice, hotel management should institutionalise structured halal awareness programmes and ensure full participation across operational departments. For example, during **Ramadan buffet operations**, where menu volume and production scale increase significantly, insufficient staff awareness may lead to cross-contamination risks or improper handling procedures.

Secondly, ingredient control remains a critical compliance area, aligning with **MPPHM 2019 (Clause on Raw Materials and Ingredients Control)**. The study identified a substantial number of undeclared ingredient observations, indicating gaps in documentation and verification processes. Correspondingly, hotels should strengthen their ingredient approval systems by implementing centralised master listings and strict verification at receiving points. This is particularly important in **Very Very Important Person (VVIP) or custom menu requests (e.g., Royal or Ministerial events)**, where last-minute ingredient substitutions may occur without proper halal verification, posing a significant compliance risk.

Thirdly, the importance of internal monitoring aligns with **MHMS 2020 (Clause 5.6: Internal Halal Audit)**. The findings demonstrate that proactive internal audits and inspections effectively detect non-conformities prior to external audits. Hotel management should therefore strengthen internal audit frequency, documentation review processes, and corrective action tracking to ensure continuous compliance.

10.2 Hotel Committees

The study highlights the critical role of halal committees in operationalising HAS in line with **MHMS 2020 (Clause 3.2: Halal Committee Responsibilities)**. Halal committees must ensure that all operational activities, particularly those involving menu changes and ingredient sourcing, comply with halal requirements. Moreover, the findings suggest that undeclared ingredients remain a key risk area, indicating the need for stricter control mechanisms. Thus,

committees should enforce mandatory verification procedures for all new ingredients and ensure that no items are used without prior approval and documentation.

In addition, halal committees should strengthen their internal monitoring systems in accordance with **MHMS 2020 (Clause 5.6: Internal Halal Audit)**. Regular inspections, cross-departmental coordination, and systematic tracking of non-conformities are essential to maintaining compliance. For instance, this includes large-scale events such as Association of Southeast Asian Nations (**ASEAN**) **meetings or high-profile conferences**, where multiple kitchens and suppliers may be involved, the risk of non-compliance increases significantly. As such, a well-coordinated halal committee can mitigate these risks through structured oversight and communication. The HCD-F framework introduced in this study can also serve as a performance monitoring tool for halal committees. Essentially, by tracking key indicators such as training coverage, ingredient control efficiency, and audit outcomes, committees can identify trends, prioritise corrective actions, and strengthen overall governance.

10.3 Regulators

The findings of this study offer important policy insights for regulatory authorities such as **JAKIM** and the **Jabatan Agama Islam Selangor (JAIS)**. Firstly, the study demonstrates that **internal has played a critical role in sustaining compliance, supporting the intent of MHMS 2020 (Clause 4: Halal Assurance System Requirements)** (JAKIM, 2020a). Regulators may consider placing greater emphasis on evaluating the effectiveness of internal monitoring systems during audits, rather than focusing solely on physical inspection outcomes.

Secondly, the high number of undeclared ingredient observations suggests the need to strengthen regulatory guidance on **ingredient declaration and documentation**, in line with **MPPHM 2019 requirements on material control**. Regulators could enhance compliance by introducing standardised digital platforms for ingredient submission and verification, reducing the risk of human error and documentation gaps. Thirdly, the HCD-F model proposed in this study offers a potential framework for **risk-based halal monitoring**. Regulators may consider adopting performance-based indicators to categorise certified organisations by compliance level, enabling more targeted surveillance strategies.

Finally, the findings reinforce the importance of training in improving compliance outcomes. Regulators could strengthen industry-wide competency by introducing **mandatory halal training** requirements and certification programmes aligned with **MHMS 2020 (Clause 4.2)** (JAKIM, 2020a). This is particularly relevant for hospitality environments, where staff turnover is high and operational complexity is significant.

11. Conclusion

This study examined how halal compliance is operationalised within hospitality organisations by analysing training programmes, ingredient declaration processes, and audit monitoring practices across four halal-certified hotels in Malaysia. Furthermore, the findings demonstrate that halal compliance is not solely dependent on certification status. Rather, it requires continuous operational monitoring and organisational commitment. Following this, internal audits and inspections serve as critical mechanisms for identifying operational risks and strengthening compliance practices before regulatory audits occur. Concurrently, ingredient control emerged as the highest-risk area, with 198 undeclared ingredient observations recorded across the four properties.

The introduction of the HCD-F represents a key contribution of this study. The framework provides a systematic framework for evaluating halal governance performance by

integrating operational indicators for training, ingredient control, and audit monitoring. As an exploratory tool, the HCD-F is presented for comparative assessment rather than as a statistically validated composite index. Note that no composite scores are calculated in this study. From a managerial perspective, the findings highlight the importance of strengthening staff training programmes, enhancing ingredient documentation systems, and maintaining proactive internal monitoring practices. At the same time, these initiatives improve organisational readiness for regulatory audits and ensure long-term halal integrity in hospitality operations.

Collectively, these findings reinforce the role of internal monitoring as a preventive control mechanism within organisational governance systems (Assessment & Activities, 2013). In response, future research may expand the HCD-F framework by applying it to larger hospitality samples, developing validated weighting methods, or examining the relationship between halal compliance performance and customer satisfaction.

12. AI Disclosure Statement

While preparing this work, the principal author (Sharifah Azwani) utilized ChatGPT to enhance the writing style, Grammarly to check the grammar, Copilot to paraphrase checking spelling errors. After using this tool, the author(s) carefully reviewed as well as revised the content as necessary and assumed full responsibility for the final publication.

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