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Thematic Section - Challenges in Production Economics Towards Sustainability and Digitalization

Exploring determinants of halal traceability systems in the Indonesia cosmetics industry

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Abstract

Paper aims: This paper investigates how variability in certification requirements, organizational capabilities, and traceability technologies influences halal traceability system readiness in the Indonesian cosmetics industry. Guided by Institutional Theory, which explains how external regulatory pressures shape organizational behavior, and the Resource-Based View (RBV), which highlights the role of internal capabilities, this study aims to identify the determinants crucial for ensuring halal traceability system readiness amid regulatory diversity and supply chain complexity.

Originality: This study fills a significant research gap by focusing on halal traceability in the cosmetics sector, an area predominantly studied in the food industry. It offers an integrated conceptual framework that links institutional Theory and RBV to enhance traceability readiness.

Research method: Qualitative analysis was conducted using semi-structured interviews with key stakeholders, including regulatory bodies, industry representatives, and material suppliers. Data was analyzed systematically with ATLAS.ti 23, ensuring reliability through inter-coder agreement.

Main findings: Institutional pressures influence traceability readiness, with organizational capabilities and traceability technologies playing critical roles in addressing compliance challenges. Key factors include adaptive compliance, organizational responsiveness, and the traceability integration of material tracking, regulatory systems, and compliance

Implications for theory and practice: As a qualitative and exploratory study, the findings are context-specific and not intended for statistical generalization. They extend Institutional Theory and RBV by demonstrating how regulatory pressures and internal capabilities shape halal traceability readiness. The study provides actionable strategies for policymakers to harmonize certification systems and for industry stakeholders to enhance training, adopt adaptive compliance, and integrate traceability technologies to support halal system integrity.

Keywords

Halal traceability system. Halal cosmetics. Institutional Theory. Organizational capabilities. Resource-Based View (RBV).

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Conflict of Interest
The authors have no conflict of interest to declare.

Ethical Statement
All participants took part in the study voluntarily and gave their informed consent. Since the data pertained to organizational practices and did not involve any personal or sensitive information, formal ethical approval was not mandated according to the relevant institutional guidelines.

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1. Introduction

The halal cosmetics industry is experiencing significant growth, driven by rising consumer awareness and demand for products that align with religious values. Recent studies provide insights into crucial determinants influencing consumer behavior in this industry. Bhutto et al. (2022) suggested that internal factors such as religious commitment and self-efficacy play vital roles in consumer decision-making, emphasizing the importance of aligning personal values with product standards. Shahid et al. (2023) highlighted that religious knowledge, commitment, and halal certifications are major influencers of consumer purchase and repurchase behavior for halal cosmetics, while religious orientation alone has limited impact. Meanwhile, Hussain et al. (2024) reveal that product quality, trust in halal certifications, and religious beliefs shape consumer attitudes, leading to increased repurchase intentions and brand loyalty among Muslim women. Similarly, Suparno (2020) confirms that individual religiosity and hedonic shopping value positively affect online purchasing intentions for halal cosmetics, emphasizing the importance of consumer attitude. Sugibayashi et al. (2019) highlights the increasing demand for halal cosmetics, and point out that the production of halal-certified products remains limited. Many of this products are produced by non-halal manufacturers using materials sourced from non-halal suppliers (Alamsyah et al., 2022). This gap emphasizes the need for clear traceability and integration of halal science in production. Moreover, Handriana et al. (2021) underscore the role of halal awareness in cosmetic products, particularly among Indonesian millennials, as a key determinant of purchase intentions. Those studies highlight the importance of brand image, halal certification, and religious beliefs, cosmetics market.

The Indonesian Halal Product Assurance Organizing Bureau (BPJPH) imposes stricter regulations requiring halal certification. However, data from the Indonesia Central Bureau of Statistics for 2023 reveals the cosmetics industry's heavy reliance on imported organic chemicals might not be halal certified, complicating halal compliance for imported materials (Badan Pusat Statistik, 2023). This reliance highlights the need for a robust halal traceability system to maintain consumer trust, meet regulatory standards, and stay competitive globally. The research problem this study addresses is the limited understanding of how halal traceability systems can be effectively implemented within the Indonesian cosmetics industry. Existing literature mainly focuses on halal traceability in food sectors (Najmi et al., 2023; Hew et al., 2020), while little attention has been given to cosmetics, which face different challenges. Specific gaps identified include: the impact of certification variability on traceability readiness, the lack of understanding regarding how organizational capabilities support halal compliance, and the limited adoption of traceability technologies in cosmetics (Sumarliah et al., 2023; Adham et al.,2024). Additionally, cosmetics companies often struggle to verify halal status for imported raw materials, manage regulatory complexity, and integrate traceability systems (Xu et al., 2022; Abd Rahman et al., 2023).

Thus, the research question (RQ) guiding this study is: What are the determinants of halal traceability system readiness in the Indonesian cosmetics industry, particularly regarding certification variability, organizational capabilities, and traceability technologies?

This investigation addresses a significant knowledge gap because halal traceability is critical for maintaining regulatory compliance (Zainuddin, 2020), ensuring consumer trust (Handriana et al., 2021) and enhancing industry competitiveness in a rapidly growing global market (Sugibayashi et al., 2019; Wahyuni et al., 2024). Inadequate traceability can undermine halal certification credibility, weaken operational performance, and reduce the trust of consumers and stakeholders (Alamsyah et al., 2022; Rashid, 2020). Therefore, identifying key determinants that strengthen traceability systems is essential for addressing regulatory complexity, ensuring supply chain transparency, and sustaining long-term business viability within the halal cosmetics sector.

The halal regulations that require a sophisticated, full traceable system to ensure all materials used in cosmetics are not only halal but also tayyib (Khan et al., 2018). This is particularly challenging given the complex global supply chain. A unified global halal standard tailored to Indonesia's needs would simplify the halal compliance for international suppliers. Improve oversight, enable by real-time tracking technologies and enhanced local authority capacity, is crucial, for enforcing standards, and boosting Indonesian market competitiveness (Wahyuni et al., 2024). Effective halal traceability involves monitoring every stage of the supply chain sourcing, storage, transit, and processing to ensure adherence to halal standards (Kim et al., 2018). However, maintaining halal integrity throughout this complex supply chain presents challenges, particularly in verifying the halal status of ingredients from diverse suppliers (Alamsyah et al., 2022; Nordin et al., 2021). Documenting the material journey through the supply chain is critical to meeting regulatory requirements and ensuring compliance at each stage (Zainuddin, 2020). Clear documentation and systematic monitoring can effectively address these challenges and uphold the integrity of halal-certified products (Rashid, 2020).

One of the critical challenges facing the Indonesian cosmetics industry is the limited availability of solutions for improving halal transparency and accountability in supply chain management (Alamsyah et al., 2022). This limitation makes it difficult to trace and confirm the halal status of products and ingredients, raising questions

about compliance with halal requirements (Tan et al., 2022). Developing advanced technologies for tracking and recording halal ingredients throughout the supply chain is essential for maintaining the integrity and trustworthiness of halal products. Such technologies can facilitate transparent verification processes and enhance overall consumer confidence in the halal beauty industry (Tan et al., 2022).

Empirical research has largely focused on the adoption of halal traceability systems in food supply chains, examining factors like institutional pressures and the perceived attractiveness of halal systems (Hew et al., 2020). However, there is a noticeable gap in addressing transparency as a pivotal element in these systems, particularly in the cosmetics industry (Sumarliah et al., 2023). Trust plays a critical role in the successful adoption and long-term viability of halal traceability systems, as it ensures stakeholders' confidence in the system's ability to meet both ethical and regulatory standards (Xu et al., 2022). Existing literature has not yet fully explained how Indonesian cosmetics firms address the challenges of halal traceability, particularly the influence of certification variability, organizational capabilities, and traceability technologies on system readiness. Further emphasis on this issue comes from the food sector, where the need for standardised traceability and greater transparency has been emphasised to ensure halal integrity (Ontok-Balah & Makakena, 2024). In the context of cosmetics, scholars have highlighted the importance of traceability systems that align with international halal standards (Prathama et al., 2023) and the role of both external regulatory demands and internal organizational capabilities in facilitating effective implementation (Prathama et al., 2024).

The Indonesian cosmetics sector also faces variability in halal certification standards, which affects how businesses manage compliance and educational efforts. Research by Khalimy et al. (2023) and Abdul Halim et al. (2024) emphasizes the significant role of legal frameworks in shaping self-regulation and reporting non-conformance. These studies show that consumer choices, deeply influenced by cultural norms and religious knowledge, are crucial in building trust in halal products (Oemar et al., 2022; Aslan, 2023). Institutional Theory offers valuable insights into how the cosmetics industry responds to external expectations and pressures, including halal certification regulations and societal norms, making it essential for the adoption of the halal traceability system.

Another significant challenge for the Indonesian cosmetics industry is its reliance on imported organic chemicals, as highlighted by the 2023 BPS transaction data. The industry faces a substantial gap between the import and export of these essential materials, posing both challenges and opportunities (Patnaik et al., 2022). From the perspective of RBV theory, this reliance can be a strategic vulnerability if the materials are not unique or differentiated. However, firms can leverage internal capabilities to source, verify, and integrate halal-certified materials, transforming this challenge into a competitive advantage (Lockett et al., 2009). Organizational capabilities are essential for enhancing performance and achieving competitive advantage. Abd Rahman et al. (2023) argue that effective knowledge management and halal logistics significantly improve supply chain performance. This aligns with RBV theory, which emphasizes that unique internal resources, such as advanced traceability systems, are key to differentiating a firm's offerings and securing a competitive edge (Barney, 1991).

Institutional Theory and RBV provide the theoretical foundation for this study's focus. Institutional Theory (DiMaggio & Powell, 1983) explains how external regulatory pressures and societal expectations drive organizations to conform to halal certification standards. Meanwhile, RBV (Barney, 1991) highlights the strategic importance of internal capabilities such as traceability systems in achieving and sustaining competitive advantage. Building on these theoretical perspectives, our study focuses on three specific gaps: the impact of certification variability on traceability readiness, the organizational capabilities required to manage halal compliance, and the integration of traceability technologies to ensure transparency and regulatory adherence. These critical gaps reflect organizations' dual pressures: external compliance demands and internal resource limitations, particularly in the halal cosmetics industry. Given these strategic challenges, the present study employs a qualitative research design based on semi-structured interviews with key stakeholders, including regulators, industry associations, manufacturers, and suppliers. Although the findings are context-specific, they contribute to the theoretical understanding and offer practical implications for improving halal traceability implementation.

This paper is structured as follows: the **introduction** outlines the study's background, objectives, and significance. Section two, Theoretical Background, presents key concepts and frameworks related to halal certification, organizational capabilities, and traceability technologies. The **literature review** examines prior research on halal certification and traceability. The **methodology** details the research approach. The **results and discussion** present findings and implications. The **conclusion** summarizes contributions and future directions.

2. Theoretical background

Implementing traceability systems in the halal cosmetics industry involves regulatory, organizational, and technological factors. To understand how these elements influence system readiness, this study is grounded in

two core theoretical frameworks: Institutional Theory and RBV. These theories guide the identification of key determinants and their roles in shaping traceability performance in response to external pressures and internal capabilities. Table 1 outlines key dimensions of halal certification, organizational capabilities, and tracking and transparency technologies. Halal certification is analyzed through Institutional Theory, focusing on three types of pressures: coercive, normative, and mimetic. Coercive pressure involves external forces like regulations and laws that compel organizations to comply with halal standards (DiMaggio & Powell, 1983). Normative pressure reflects industry standards and societal expectations, while mimetic pressure refers to organizations imitating successful peers to enhance legitimacy in halal practices (DiMaggio & Powell, 1983).

Table 1. Analytical dimensions and associated theoretical frameworks.

Dimension	Sub Dimension	Theory
Halal Certification	Coercive Pressure	Institutional Theory
	Normative Pressure	Institutional Theory
	Mimetic Pressure	Institutional Theory
Organizations Capabilities	Organization Capability	Resource Based View
Tracking and transparency technologies	Traceability Technology	Resource Based View

Based on the Resource-Based View (RBV), organizational capabilities emphasize the importance of internal resources such as skills and competencies, which help firms maintain a competitive edge and comply with halal standards (Barney, 1991). Lastly, tracking and transparency technologies focus on traceability, ensuring that halal products are effectively monitored throughout the supply chain. This dimension uses the RBV to highlight the role of technology in supporting traceability, compliance, and transparency in production and distribution processes (Barney, 1991).

2.1. Halal certification

A literature review of halal certification requirements highlights the process, effects, and analysis. The certification process and its associated challenges, environment, and pressures are universally recognized as significant. Environmental factors and regulatory pressures primarily influence the effects of Halal certification. Finally, a comprehensive analysis of Halal certification involves considering the challenges, environment, and regulatory pressures altogether. This integrated approach underscores the complexity and multifaceted nature of achieving and maintaining Halal certification, emphasizing the need for thorough understanding and compliance across various dimensions.

Table 2 summarizes the empirical literature review on halal certification, where halal certification and awareness encompass various domains and methodologies, reflecting researchers' diverse approaches to exploring this field.

Table 2. Halal certification requirements.

Classification	Regulation Challenge	Regulation Environment	Regulation Pressure
Certification Halal Process			Khalimy et al. (2023); Abdul Halim et al. (2024); Shariff & Lah (2014)
Effect Halal Certification	Oemar et al. (2022); Aslan (2023)	Salindal (2019)	
Halal Certification Analysis	Wannasupchue et al. (2023); Kasri et al. (2023)	Sukoso et al. (2022); Atabik & Muqtada (2024); Ruhaeni & Aqimuddin (2023); Latif et al. (2014)	Adham et al. (2024)

Khalimy et al. (2023), Abdul Halim et al. (2024) and Shariff & Lah (2014) focused on the legal frameworks and compliance issues in general and food domains, respectively, using comparative and quantitative analyses to address self-declaration and non-conformance in halal certification. Awareness and intention towards halal certification are explored by Oemar et al. (2022) and Aslan (2023), who employ structural equation modeling to assess the impact of halal awareness on registration intentions and purchasing behaviors in the general and food sectors. While Wannasupchue et al. (2023) and Kasri et al. (2023), through qualitative explorations and descriptive analyses, this study addressed the challenges and acceptance of halal certification in the food and pharmaceutical industry. The impact and adoption of halal certification were critically analyzed by Salindal (2019) and through structural equation modeling, focusing on business performance and adoption barriers in the general domain. They Explored legal aspects concerning halal food certification while Atabik & Muqtada (2024) delved into religious principles supporting vaccination programs in the pharmaceutical sector. In sector-specific studies, Sukoso et al. (2022) combined interviews and lab testing to examine the quality and certification

of fishery products, whereas Latif et al. (2014) conducted a comparative analysis of global halal certification requirements. Through qualitative research and discussion, studies by Adham et al. (2024) and Darmalaksana (2023) further elaborate on halal certification processes in Malaysia and Indonesia's cosmetics and pharmaceutical industries. These sector respond to certification challenges, reinforcing the importance of studying institutional influences on organizational practices, particularly in sourcing and certifying raw materials. Institutional Theory helps elucidate these companies' external pressures, such as regulatory requirements, industry association, and successful similar company implementation.This approach reveals the depth of institutional pressures shaping industry practices in Indonesia's highly regulatory and culturally complex cosmetics market.

2.2. Organization capabilities

The literature review on organizational capabilities categorizes various approaches. Dynamic Capabilities Theory highlights the link between capabilities, performance, and innovation. Institutional Pressures and RBV examine the impact of institutional factors on capabilities. Necessity Logic also focuses on capabilities and performance. The RBV approach further explores capabilities and performance, as well as innovation.

Table 3 explains the organization's capability for the empirical study. In summary, the literature review categorizes several studies into common themes based on the theories and methodologies applied, each focusing on the role of organizational capabilities in various business contexts. Under the Dynamic Capabilities Theory, Yoshikuni et al. (2023) develop a scale for big data analytics-enabled dynamic capabilities and Jifri et al. (2023) assess the Sustainability of these capabilities during economic crises, highlighting the adaptability required in volatile markets.

Table 3. Organization capability.

Approach	Categories	Author's
Dynamic Capabilities Theory	Capabilities and Performance	Jifri et al. (2023)
	Innovation and Capabilities	Yoshikuni et al. (2023)
Institutional Pressures and RBV	Institutional and Capabilities	Castro-Lopez et al. (2023)
Necessity Logic	Capabilities and Performance	Ofori (2024)
Resource-Based View (RBV)	Capabilities and Performance	Abd Rahman et al. (2023); Heriqbaldi et al. (2023); Samadi et al. (2023); Rehman et al.(2019)
	Innovation and Capabilities	Nguyen et al. (2023); Wijaya et al. (2023)

The studies by Castro-Lopez et al. (2023) explain Organizational Capabilities and Institutional pressures that drive the adoption of the circular economy practice. Studies (Ofori, 2024) mention the necessity of resilience in organizational capabilities within the hotel industry, identifying several key factors contributing to resilient service operations. In the domain of RBV, Abd Rahman et al. (2023) and Heriqbaldi et al. (2023) utilize this Theory to examine how organizational capabilities impact supply chain performance and international business, respectively. Broadly addressing organizational capabilities, Samadi et al. (2023) and Rehman et al. (2019) focused on how diverse organizational capabilities contribute to international performance and overall business effectiveness, emphasizing the marketing capabilities of knowledge-based firms. Further, Nguyen et al. (2023) explored the influence of organizational capabilities on the adoption of innovative business models, such as the circular economy and green organizational practices, demonstrating how these capabilities drive competitive advantages. In the technological realm, Wijaya et al. (2023) discusses the significant role of IT capabilities in enhancing SME (Small-Medium Enterprises) competitiveness through digitalization, particularly in the halal food industry.

According to the literature analysis and the focus on RBV in several studies, it is clear that RBV can provide a robust theoretical foundation for organisational capabilities that affect the management of imported materials for halal compliance. Organisational capabilities can be leveraged to enhance operational and strategic outcomes in compliance-driven and international business contexts. Specifically, Abd Rahman et al. (2023) highlights how halal logistics practices, backed by robust organisational capabilities, improve supply chain effectiveness. While Institutional Theory and RBV form the core theoretical foundation of this study, the inclusion of Dynamic Capabilities Theory and Necessity Logic further illuminates how firms navigate regulatory uncertainty and resource constraints in achieving halal traceability readiness

2.3. Halal traceability system

Halal traceability systems are increasingly emphasized in recent literature as essential mechanisms to ensure product authenticity, regulatory compliance, and consumer confidence. While early studies focused primarily on

food sectors, emerging research explores how technology supports traceability in halal-sensitive environments. These systems enhance transparency, monitor product movement, and maintain integrity across complex supply networks. Building on this foundation, the present study examines how such traceability mechanisms are adopted in the halal cosmetics industry

Table 4 illustrates how halal traceability has been examined in various sectors, with particular emphasis on food-related industries. Najmi et al. (2023) analyzed how halal food standards, government regulation, and consumer pressure influence traceability adoption, showing its impact on operational and compliance outcomes.

Table 4. Traceability in various sectors.

Author(s)	Domain	Technologies	Regulation	Variables
Najmi et al. (2023)	Food	Traceability Systems	Halal Food Regulation	Government Regulation, consumer pressures, industry competition, Operation Improvement, marketing, organizations commitments; Halal Food standard Adoption, Traceability system, compliance towards HAS
Vanany et al. (2024)	Food	Blockchain	Halal Food Guarantee	Halal strategy, Coercive pressures, Mimetic pressures, Normative pressures, Compatibility, Complexity, Perceived benefits
Hew et al. (2020)	Food	Blockchain	Halal Food Regulation	Halal Orientation strategy, Institutional pressures, perceived desirable, Intention to Participate
Ab Rashid & Bojei (2020)	Food	Traceability Systems	Halal Food Regulation	Halal traceability system adoption, Halal industry environmental factors, Halal food supply chain integrity
Akbar et al. (2022)	Food	Blockchain	Halal Certification	
Zainuddin (2020)	Food	Traceability Systems	Halal Food Regulation	Halal Traceability System and Halal Supply Chain Performance
Fernando et al. (2023)	Food Logistics	Halal Traceability Technology	Halal Certification	System, Training, Halal Logistic Brand, Halal Logistics Performance

Vanany et al. (2024) l extended this by examining institutional pressures, coercive, mimetic, and normative and strategic compatibility, in adopting halal assurance systems. Hew et al. (2020) explored the influence of halal orientation strategy and institutional forces on participation intention in traceability systems. Similarly, Ab Rashid & Bojei (2020) investigated traceability adoption and its impact on food supply chain integrity under industry and environmental pressures. Akbar et al. (2022) addressed broader halal certification mechanisms, Zainuddin (2020) connected traceability implementation directly to supply chain performance, reinforcing the importance of traceability in meeting halal regulatory expectations. Finally, Fernando et al. (2023) focused on logistics, demonstrating how traceability systems, training, and certification programs enhance halal logistics performance. Collectively, these studies provide a solid foundation for understanding halal traceability implementation, yet most focus on the food sector. This reinforces the relevance of the current study, which addresses a significant gap by extending the discussion into the cosmetics industry, where diverse ingredient sources and complex certification requirements compound traceability challenges.

2.4. Comparative analysis of halal traceability studies

The following table presents a gap matrix comparing recent halal traceability studies across sectors. It highlights which dimensions certification variability, organizational capability, and traceability technology are addressed in each study. This comparison helps position the current research as a comprehensive response to unresolved gaps, particularly within the halal cosmetics context.

Table 5 summarizes prior research on halal traceability systems across different sectors, highlighting how each study contributes to understanding certification, capability, and technology. While halal traceability in the food and logistics sectors has been widely explored by Najmi et al. (2023) and Abd Rahman et al. (2023), most studies address only one or two dimensions of the issue. For instance, some focus solely on halal certification or logistics capabilities, while others highlight technological tools like blockchain without linking them to organizational readiness or regulatory compliance. Very few studies have combined all three factors, especially in the cosmetics industry. This study fills that gap by integrating certification variability, organizational capability, and traceability technologies to assess halal traceability system readiness in Indonesia's cosmetics sector using Institutional Theory and RBV.

Table 5. Positioning of the current study within existing halal traceability literature.

	Sector	Certification Variability	Capability	Traceability Technology	Theory	Notes
Najmi et al. (2023)	Food	√	√	-	Institutional Theory	Halal food traceability focus lacks a discussion on technology integration.
Sumarliah et al. (2023)	Food	-	-	√	Tech Adoption Model	Explores blockchain in halal food; does not address certification or organizational capability.
Huang et al. (2018)	Pharma	-	-	√	None	Not halal-specific; provides tech insight applicable to halal contexts
Abd Rahman et al. (2023)	Logistics	-	√	-	Resource-Based View (RBV)	Focuses on halal logistics and capability; lacks certification and tech aspects
Adham et al. (2024)	Cosmetics	√	-	-	Systems Theory (VSM)	Halal certification in the cosmetics context does not integrate tech or capability.
Current Study	Cosmetics	√	√	√	Institutional Theory + RBV	Halal traceability in cosmetics addresses all three key dimensions

3. Methods

3.1. Research design

This study adopts a qualitative research design and employs a qualitative exploratory approach, suitable for uncovering contextual insights in complex situations. The design was structured to ensure methodological rigor and relevance by aligning the data collection and analysis stages with the research objectives. A sequential process was adopted, as illustrated in the following figure.

Figure 1 outlines the sequential process followed in this study. The research began with defining objectives and identifying gaps through a literature review. An interview protocol was developed to guide semi-structured interviews with selected participants. Data coding followed, supported by inter-coder agreement and coder evaluation. Codes were then linked with quotations, and findings were interpreted and discussed. This iterative process led to developing the proposed conceptual framework for halal traceability readiness in the cosmetics industry.

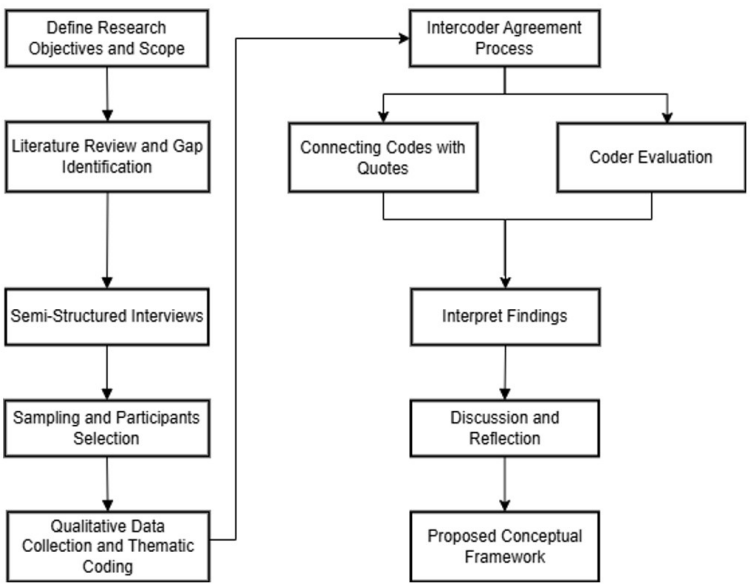

Figure 1. Research methodology flowchart.

3.2. Semi-structure interview

In this study, a semi-structured interview methodology was employed to gather qualitative data from key stakeholders in the halal cosmetics industry in Indonesia. The interviews were designed based on the research

questions and literature review, ensuring the data collected was relevant and comprehensive for building research determinants (Creswell, 2018). The sampling strategy employed purposeful sampling (Patton, 2015), selecting informants who held critical positions and possessed expertise in halal certification, regulatory affairs, and industry practices. Participants included representatives from BPJPH (Indonesia Halal Product Assurance Organizing Agency), PERKOSMI (Indonesian Cosmetics Association), a public-listed cosmetics company, and a raw material supplier. As this study employed a non-random, purposeful sampling strategy, the findings are context-specific and are not intended to be statistically generalized.

3.3. Sampling and participant selection

Based on Table 6, the informants for this study come from a range of institutions, each bringing critical expertise to the research.

Table 6. Research informant.

Initials Name	Initials Role	Expertise	Institutions Desc
SG	The Steering Board Direction of BPJPH	Professor in public university and head of Halal Center	The Halal Product Organizer Guarantee Body (BPJPH)
SA	Steering Board PERKOSMI	Business master and commissioner in a leading Indonesian company.	Indonesia Cosmetic Industry Association (PERKOSMI)
SS	Manager Regulatory Cosmetic Company	Industrial engineering degree and experience in registration and regulation for Indonesia standard and regulation requirements	Leading cosmetics company in Indonesia and top three based on company revenue listing company
EM	Manager Regulatory Material Supplier	Chemical engineering degree and experience in registration and regulation for Indonesia's standard and regulation requirements	Leading top ten fragrance company in the world

SG, a professor and head of the Halal Center, represents the Steering Board Direction of BPJPH, Indonesia Halal Product Organizer Guarantee Body, playing a pivotal regulatory role in setting halal standards. Similarly, SA, the steering board of the Indonesian Cosmetic Industry Association, oversees compliance and regulatory affairs for the industry. More detailed insights come from SS and EM, representing industry-leading institutions in Indonesia and globally. SS, a regulatory affairs manager, works for one of Indonesia's top three cosmetics companies in terms of revenue. This company is a leading player in the local market, heavily involved in adhering to Indonesia's stringent regulatory requirements and playing a crucial role in influencing industry standards. SS's experience in regulatory compliance and product registration makes this perspective valuable in understanding how industry leaders align with consumer expectations and government standards. EM, also a Manager of Regulations, is employed by one of the top ten fragrance companies worldwide. As a global company, its leader stands out for its innovation, safety, and traceability standards.

3.4. Qualitative data collection and thematic coding

Interview data were collected using a semi-structured format and analyzed using Braun & Clarke (2006) Six-phase thematic analysis. This involved familiarization, generating initial codes, searching for themes, reviewing, defining, naming, and producing the report. Transcripts were coded first inductively to capture emergent insights, then deductively through axial coding informed by the study's theoretical framework. This hybrid approach enabled the development of three central themes: adaptive compliance, organizational responsiveness, and traceability integration, each aligned with Institutional Theory and RBV (DiMaggio & Powell, 1983; Barney, 1991). Subthemes were generated within each main theme to capture specific patterns in the data, forming the basis for interpretation in the following section.

3.5. Inter-coder agreement and validity

To strengthen internal validity, the study applied inter-coder reliability testing using Krippendorff's alpha and conducted member checking to confirm interpretation accuracy. Data collected through structured interviews will be analyzed using multiple coders to ensure reliability. A key step involves applying inter-coder agreement (ICA) to evaluate the consistency of interpretations between coders. Krippendorff's alpha will measure agreement, with a threshold of $\alpha \geq 0.80$ indicating high reliability. This approach enhances the trustworthiness of the analysis and minimizes the risk of chance-based agreement (González-Prieto et al., 2021). This process involved two

coders: the researcher, with 23 years of experience in the cosmetic industry, and an external halal expert from the Indonesia Cosmetics Association, a member with 10 years of experience. The collaboration between these coders further strengthens the objectivity and reliability of the analysis. For external validity, the study employed data triangulation across multiple informant types, regulatory bodies (BPJPH), industry associations (PERKOSMI), and manufacturers to represent the broader halal cosmetics ecosystem (Patton, 2015).

3.6. Coding process and data analysis

In this study, the qualitative data analysis was conducted using **ATLAS.ti 23**, a software tool designed for qualitative research, to code and analyze the interview transcripts systematically. The **inter-coder agreement** (ICA) process was applied to ensure the consistency of the coding and validated using **Krippendorff's alpha.** An alpha threshold of 0.8 or higher was required to confirm the agreement, following established reliability guidelines (González-Prieto et al., 2021). This approach minimizes the risk of subjective bias and ensures that the coders' interpretations are reliable and trustworthy, which is crucial for generating credible results in qualitative research (Rau & Shih, 2021). Additionally, **Cohen's kappa** was employed to assess inter-rater reliability, reinforcing the trustworthiness of the coding process by correcting for chance agreement, which is critical in validating qualitative data coding (Sun, 2011).

Table 7 reports the results from the ATLAS.ti 23 coding process demonstrates a high level of agreement between the two coders, a halal expert and the researcher. The coding focused on key topics such as alternative materials, challenges, customer communication, and government traceability systems. For example, the Training Program code was the most extensively covered, with both coders applying it to 9.39% and 9.40% of the data, respectively (González-Prieto et al., 2021). For ensure the reliability of the coding process, Krippendorff's c-Alpha-binary was used as the measure of inter-coder agreement. The result was an exceptionally high alpha

Table 7. Krippendorff's c-Alpha-binary result from Atlas.ti 23.

Code	Coder	Applied	Text (Words)	Total Coverage	Remarks
Alternative Materials	Expert Halal	3	800	5.63%	Halal-certified material substitutes
	Researcher	4	1,139	8.02%	
Discrepancies	Expert Halal	4	805	5.67%	Differences in Halal compliance standards
	Researcher	4	804	5.66%	
Halal Anssurance system	Expert Halal	3	792	5.57%	Framework ensuring halal compliance
	Researcher	4	914	6.43%	
Halal Critical Material	Expert Halal	5	1,062	7.47%	High-risk materials needing control
	Researcher	3	507	3.57%	
Training Program	Expert Halal	5	1,334	9.39%	Employee education on halal
	Researcher	5	1,335	9.40%	
Update Regulation	Expert Halal	5	972	6.84%	Adapting to evolving halal rules
	Researcher	5	971	6.83%	
Capabilities	Expert Halal	4	368	2.59%	Internal resources for compliance
	Researcher	4	368	2.59%	
Material Tracking	Expert Halal	3	639	4.50%	Monitoring materials across supply chain
	Researcher	3	640	4.50%	
Operational Traceability System	Expert Halal	3	906	6.38%	Tracking operations for halal compliance
	Researcher	3	906	6.38%	
Traceability System	Expert Halal	3	882	6.21%	Transparency across the supply chain
	Researcher	3	883	6.22%	
Challenges	Expert Halal	2	154	1.08%	Barriers to achieving halal compliance
	Researcher	3	318	2.24%	
Commitment	Expert Halal	3	312	2.20%	Organizational dedication to halal
	Researcher	3	348	2.45%	
Development Local Materials	Expert Halal	1	573	4.03%	Fostering domestic halal-certified materials
	Researcher	1	574	4.04%	
Government Traceability System	Expert Halal	1	320	2.25%	Regulatory system ensuring compliance
	Researcher	1	321	2.26%	
Positive list	Expert Halal	1	236	1.66%	Pre-approved halal materials
	Researcher	1	237	1.67%	

Reliability Coefficient Krippendorff's c-Alpha-binary: 0.995.

Table 7. Continued...

Code	Coder	Applied	Text (Words)	Total Coverage	Remarks
Self Declare	Expert Halal	1	207	1.46%	Simplified halal compliance declaration
	Researcher	1	206	1.45%	
Communication with Customers	Expert Halal	1	331	2.33%	Building customer trust through information
	Researcher	1	330	2.32%	
Halal Authority Transfer	Expert Halal	1	163	1.15%	Coordination between certifying bodies
	Researcher	0	-	0.00%	
Internal Audits	Expert Halal	1	213	1.50%	Regular internal compliance checks
	Researcher	1	213	1.50%	
Variation Requirements	Expert Halal	2	343	2.41%	Ensure diverse halal compliance
	Researcher	3	560	3.94%	

Reliability Coefficient Krippendorff's c-Alpha-binary: 0.995.

value of 0.995, which indicates almost perfect agreement between the coders (González-Prieto et al., 2021). This high level of inter-coder reliability validates the consistency of the coding and ensures that the qualitative data analysis is both reliable and rigorous (Sun, 2011). Such a robust agreement minimizes subjective bias and strengthens the overall validity of the research findings (Rau & Shih, 2021).

4. Results and discussions

This section presents the study's key findings, structured around three research propositions from the thematic analysis. These propositions reflect patterns across stakeholder experiences and offer insights into how certification variability, organizational capabilities, and traceability technologies shape halal traceability system readiness. The results also support the development of a conceptual framework, which integrates these dimensions to explain readiness dynamics in the Indonesian cosmetics sector. To elaborate on interview findings, each proposition is presented alongside supporting thematic evidence drawn from interviews. This approach ensures the results remain grounded in empirical data while linking them to the study's broader conceptual and theoretical context.

4.1. Thematic coding structure

This subsection presents the thematic coding structure used to analyze stakeholder responses, following the approach discussed in Jacoby & Siminoff (2008). Qualitative research involves creating a hierarchy of overarching themes and their corresponding sub-themes based on the data. Parent codes represent broad, general categories that capture the main ideas or concepts expressed during interviews. Child codes, on the other hand, are more specific and detailed, offering insights into particular aspects or dependencies that are connected to the parent codes. This hierarchical structure helps researchers understand the relationships within the data, showing how broad themes influence or connect to detailed elements.

The analysis of parent and child codes begins with the institutional pressure dimension, and Figure 2 highlights distinct frameworks where thematic relationships are structured hierarchically. BPJPH and PERKOSMI

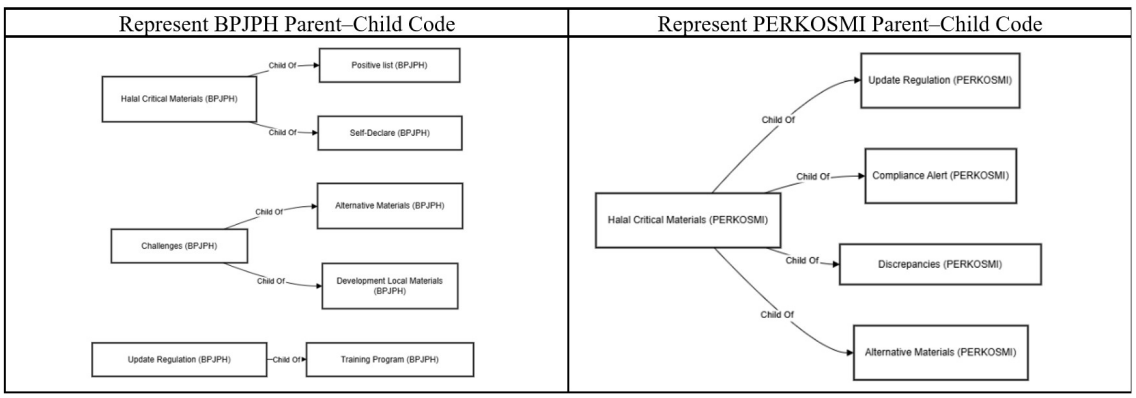

Figure 2. Institutional pressure dimensions parent-child code BPJPH and PERKOSMI representative.

exhibit hierarchical relationships, with BPJPH focusing on regulatory priorities and PERKOSMI emphasizing compliance mechanisms. These distinct parent–child dynamics adapt based on organizational objectives and institutional pressures. This figure reflects Institutional Theory and the typology of coercive, normative, and mimetic pressures. The concepts illustrated include external regulatory demands, industry norms, and the tendency to imitate successful practices. These concepts are visualized as parent and child nodes, representing organizational expectations and specific actions. The identified codes also reflect Institutional Theory, with coercive and normative pressures shaping regulatory responses. These pressures influence how BPJPH and PERKOSMI structure compliance actions and interpret external expectations.

Figure 3 builds upon the institutional pressure dimension by showing how cosmetic companies and material suppliers respond to regulatory complexity and external certification demands. This figure reflects the application of **Institutional Theory**, particularly the dynamics of **coercive and normative pressures**. The cosmetic company demonstrates a structured response to institutional demands through adaptation strategies to address certification variability and operational challenges. Similarly, the material supplier illustrates normative responses through a commitment to standards, transparent communication, and alignment with evolving regulatory systems. These thematic hierarchies underscore how organizations internalize external expectations, translating them into formal structures and actions consistent with institutional logic. A recurring focal point across both Figure 2 and Figure 3 is the issue of *halal critical materials*, which consistently emerges in stakeholder responses. As illustrated in the quotes below, this theme underscores its strategic importance in regulatory compliance and traceability implementation.

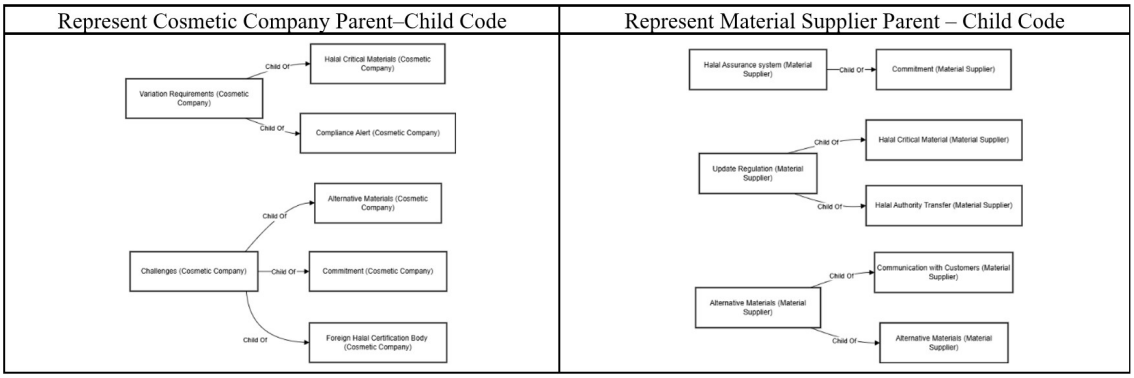

Figure 3. Institutional pressure dimensions parent-child code cosmetic company and material supplier representative.

Represent BPJPH highlight regarding halal critical material.

The main requirements for halal certification divide ingredients and products into three categories: haram (prohibited), halal (allowed without certification), and critical (requiring stricter handling due to the risk of contamination). Clear regulations prohibit the use of haram ingredients in halal-certified products. Halal ingredients such as fruits and vegetables do not always require certification unless there is a risk of contamination. However, critical materials processed using equipment that is also used for non-halal substances require strict inspection.

On the other hand, PERKOSMI highlights halal critical material

The halal certification requirements for cosmetic companies related to raw materials vary according to the level of risk or potential of ingredients that are considered critical in the halal assessment process

For cosmetics company highlights halal critical material

In particular, if the raw materials are imported and fall into the category of critical materials, then the tracking process becomes more difficult, so the company's operational conditions become more challenging.

Material supplier face another side regarding halal critical material

Highlighting the increasing challenges due to the new regulations, especially those introduced by BPJPH. The regulation adds a layer of complexity to the certification process, including requirements for Halal certification of ingredients outside of the existing positive list and strict new rules regarding the import of Halal products.

Interviewee insights reinforce Institutional Theory, particularly the influence of coercive and normative pressures. BPJPH's strict handling of critical materials and inspection protocols illustrates coercive pressure through regulatory enforcement. PERKOSMI's emphasis on material risk levels shows normative pressure, reflecting industry-driven expectations. The cosmetics company and material supplier highlight challenges with imported ingredients and new certification rules, confirming how institutional demands shape operational practices. These perspectives align with the theoretical framework and demonstrate how external pressures are internalized across the halal cosmetics sector.

Figure 4 illustrates how organizational capabilities play a central role in halal traceability readiness, grounded in the RBV. This perspective emphasizes that firms' internal resources and routines such as structured assurance mechanisms, performance commitment, and process monitoring can be developed and leveraged to meet external compliance demands. The figure reflects how institutions like BPJPH and PERKOSMI translate regulatory pressures into capability-building efforts, reinforcing the theoretical linkage between resource mobilization and regulatory adaptation. These capabilities, shaped through routines and systematized responses, support the operational implementation of halal standards in the cosmetics industry.

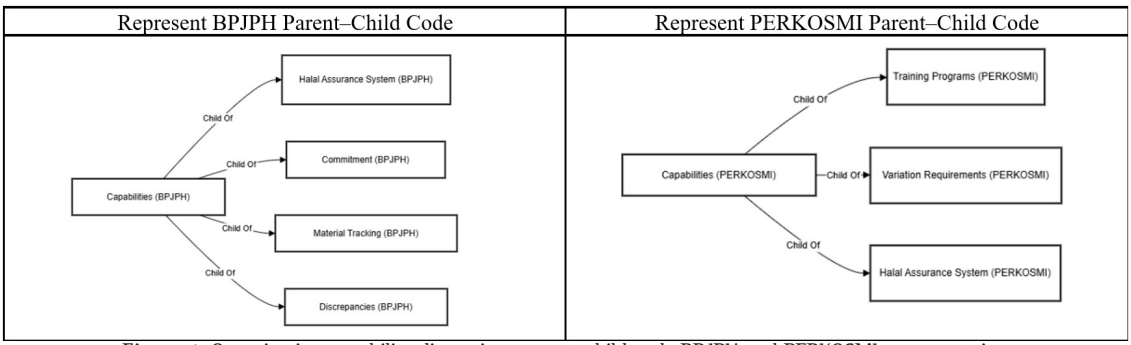

Figure 4. Organization capability dimensions parent-child code BPJPH and PERKOSMI representative.

Figure 5 reflects the RBV as the dominant theoretical lens, emphasizing how internal organizational capabilities shape readiness for halal traceability. The cosmetic company and material supplier demonstrate core RBV concepts such as commitment, systemized compliance structures, and workforce training. These are viewed as strategic resources that provide a competitive advantage in navigating halal certification demands. By mapping these capabilities through parent-child relationships, the figure reveals how firms mobilize internal routines to meet institutional expectations and sustain operational integrity. Figures 4 and 5 show that the *Halal Assurance System* emerges as a central capability theme emphasized across institutional and industry stakeholders. The following quotes reinforce its pivotal role in shaping consistent and compliant organizational routines within halal traceability efforts.

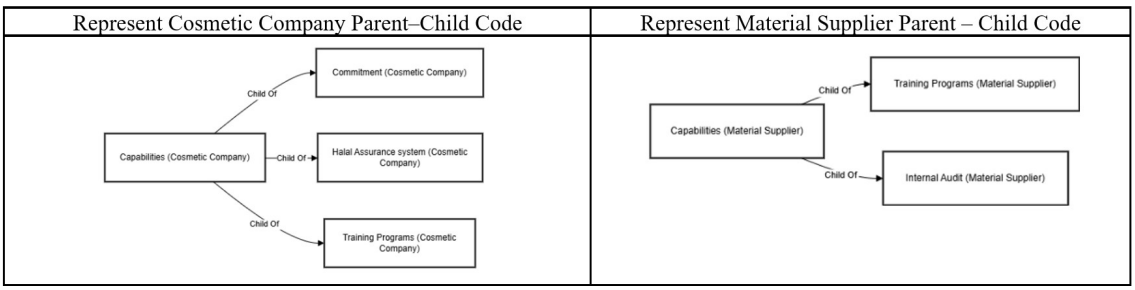

Figure 5. Organization capability dimensions parent-child code cosmetic company and material supplier representative.

Represent BPJPH highlight regarding the halal assurance system.

It outlines five fundamental principles: commitment from the organization, use of halal ingredients, contamination-free processes, proper product naming, and internal evaluation. BPJPH representative emphasizes that a dedicated halal management team oversees this process.

Represent PERKOSMI highlight regarding the halal assurance system.

Companies that generally understand halal standards and maintain a well-integrated management system successfully implement them. Implement accurate documentation for all materials and processes and practical cooperation with suppliers to ensure compliance.

Represent cosmetic company highlight regarding the halal assurance system.

Emphasized that the company is committed to implementing a halal assurance system.

Represent the material supplier highlight the halal assurance system.

Explained that the company has fully integrated the Halal Assurance System (SJH) into their operations so that all materials used in production strictly comply with Halal standards. The system is built based on procedures

that have been evaluated and validated, guaranteeing compliance with Halal requirements at every stage of production. The representative emphasized that their commitment to Halal certification is a regulatory imperative and a core aspect of operational integrity.

Interviewee responses confirm the relevance of the RBV in halal traceability readiness. The BPJPH and PERKOSMI representatives highlighted structured practices such as documented procedures, organizational commitment, and supplier cooperation as essential elements of the Halal Assurance System. These internal routines reflect RBV's emphasis on unique firm capabilities as sources of advantage. Similarly, both the cosmetic company and material supplier described full integration of halal protocols into operations, supporting the idea that capability-driven systems can align with institutional expectations and ensure compliance.

Figure 6 illustrates the traceability technology dimension through the lens of the RBV, which positions internal systems as critical strategic assets. BPJPH emphasizes regulatory oversight and centralized monitoring, reflecting how governmental actors build traceability as an institutional capability. In contrast, PERKOSMI highlights process alignment and workforce readiness, indicating how industry actors embed traceability practices within their organizational infrastructure. These stakeholder perspectives show how internal systems are developed not just for compliance but as core operational competencies. This affirms RBV's assumption that firms leverage internal resources to meet external demands, and it reinforces the theoretical framework without contradiction.

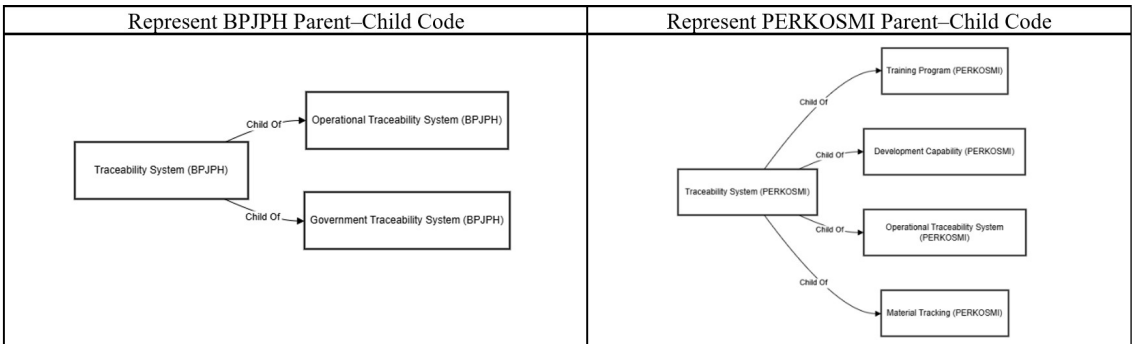

Figure 6. Traceability technology dimensions parent-child code BPJPH and PERKOSMI representative.

Figure 7 reflects the RBV, which emphasizes the strategic value of internal systems in achieving operational advantage. From this perspective, cosmetic companies illustrate how traceability is leveraged to improve operational efficiency and internal control through integrated systems and data management. Meanwhile, material suppliers demonstrate how traceability supports compliance, adaptability, and alignment with evolving regulatory expectations. These stakeholder perspectives align with RBV by showing how firms rely on their internal resources and technological capabilities to meet external halal certification demands, validating the theoretical framework applied in this study. As shown in Figures 6 and 7, traceability systems represent core internal capabilities developed to meet halal compliance expectations, aligning with RBV emphasis on leveraging strategic resources. The following interview excerpts demonstrate how these systems are operationalized across different stakeholder levels to support transparency, monitoring, and regulatory alignment.

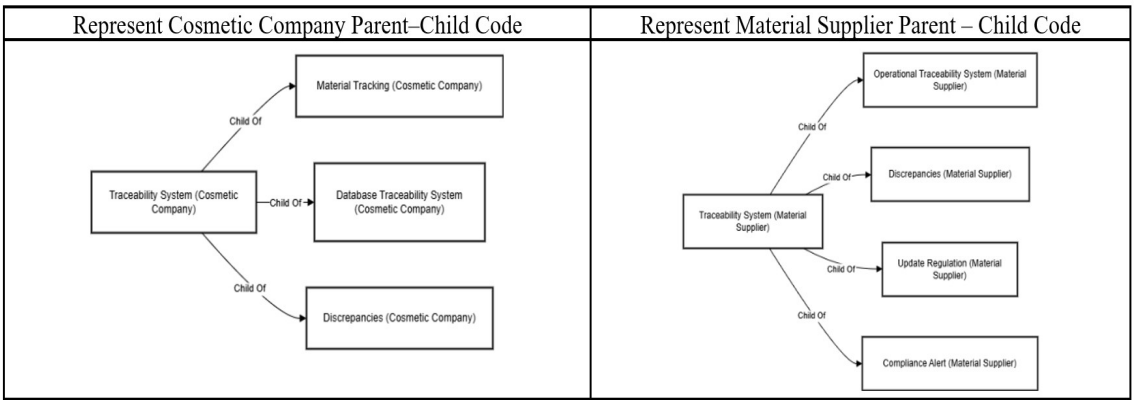

Figure 7. Traceability technology dimensions parent-child code cosmetic company and material supplier representative.

Represent BPJPH highlight regarding the traceability system.

Many large companies have tracking systems, which are not yet fully integrated into the certification process. Some companies have developed systems to track materials and products, but small companies have slowly adopted such technology. BPJPH is working to connect the tracking system with the certification process to increase transparency and facilitate monitoring. While there has been progress, there is still room for improvement, especially ensuring the tracking system is accessible and practical for all companies.

Represent PERKOSMI highlight regarding the traceability system.

Many member companies have adopted traceability technology that provides transparency by allowing certain personnel involved in halal management to access ingredient information in real time. The benefits of using this technology include easy tracking of material changes, more straightforward compliance during regulatory audits, effective risk management by identifying weaknesses in the production process, and increased consumer confidence by ensuring the halal status of the final product.

Represent cosmetic company highlights regarding the traceability system.

The company has developed a database that records all its raw materials and supporting documents, such as facility statements and statements of origin. The relevant departments can access this database. The technology used by the company, especially this database, plays a role in ensuring traceability of raw materials and compliance with halal requirements. The use of this technology cannot be ignored significantly because regulations related to halal certification often change. Technology helps companies stay compliant with these evolving regulations.

Represent the material supplier and highlight the traceability system.

A key element of compliance is a traceability system that plays an essential role in maintaining the integrity of the Halal certification process. The system meticulously tracks and documents every ingredient from procurement to production, ensuring that all final product components comply with Halal standards. The system is designed to detect and flag any non-conformities, such as incorrect delivery or unauthorized formula changes, ensuring that potential issues are resolved before they affect the final product. This oversight level is vital to maintaining the high standards required for Halal certification.

Stakeholder insights support the RBV by showing how internal capabilities are used to maintain halal compliance. BPJPH and PERKOSMI emphasize the need for integrated traceability systems to enhance regulatory transparency and operational monitoring. Cosmetics companies rely on centralized databases to trace raw materials and adapt to evolving halal regulations. Similarly, material suppliers use systemized tracking to ensure ingredient compliance and resolve non-conformities, reinforcing the role of internal technological resources in sustaining halal traceability.

4.2. Research propositions and core dimensions

The discussion begins with the role of certification variability and the institutional pressures it creates. The variability of halal certification requirements impacts traceability readiness through challenges in material compliance. Addressing these pressures necessitates adaptive compliance (Najmi et al., 2023). These findings underscore the necessity of an adaptive approach to address the variability in halal certification requirements while maintaining operational feasibility. Stakeholders' insights validate the importance of developing adaptive compliance frameworks that include targeted material protocols, proactive regulatory mechanisms, and integrated traceability systems. As the Research Proposition (RP) outlines, mitigating institutional pressures and ensuring traceability readiness in the cosmetics industry is essential.

RP1: The variability in halal certification material requirements creates institutional pressures that impact traceability readiness in the cosmetics industry. Key challenges include ensuring material compliance, sourcing critical materials, and reconciling diverse global and local standards. Addressing these challenges requires adaptive compliance with targeted material protocols, more precise regulatory guidance, and robust traceability systems to enhance operational alignment and resilience.

Building on the need for adaptive compliance, the second research proposition focuses on the internal organizational capabilities that support firms in responding to dynamic regulatory environments. Interview findings highlight the importance of Halal Assurance Systems as a foundation for organizational responsiveness. By combining formal commitment, contamination-free processes, systematic documentation, and supplier coordination, firms can maintain compliance amid changing certification landscapes. This responsiveness enables proactive material management, facilitates regulatory alignment, and reduces the risk of operational disruptions key factors in enhancing traceability system readiness.

RP2: **Organizational responsiveness**, characterized by adaptive **Halal Assurance Mechanisms**, agile **Material Tracking**, and dynamic **Training Programs**, is essential to addressing the variability of halal certification requirements. Responsive systems enhance traceability readiness by enabling organizations to manage material compliance proactively, align with shifting regulatory demands, and mitigate operational disruptions across the Indonesian cosmetics industry.

Continuing from the role of internal capabilities, the third research proposition examines how traceability integration supports operational alignment and regulatory compliance. Insights from the interviews reinforce the foundational concept of internal integration, which refers to the interdependence of system components that collectively ensure efficiency and responsiveness (Nyamawe et al., 2018). This is further supported by Allen et al. (2000), who emphasize the value of strong intramodule linkages in fostering adaptable and coherent systems. This integration involves harmonizing internal processes, such as material tracking, compliance protocols, and regulatory alignment, in halal traceability, into a cohesive operational framework. By addressing material variability and institutional misalignment, traceability integration enhances the industry's ability to maintain compliance with evolving certification requirements.

RP3: Traceability integration, characterized by aligned material tracking, synchronized compliance protocols, and integrated regulatory systems, strengthens the relationship between institutional pressures and halal traceability readiness. By fostering consistency, adaptability, and operational efficiency, traceability integration enables the Indonesian cosmetics industry to address regulatory variability and maintain compliance with halal standards.

These three propositions are grounded in the theoretical foundations discussed earlier. As confirmed by regulatory and industry stakeholders, RP1 is supported by Institutional Theory, particularly the role of coercive and normative pressures in shaping compliance behavior. RP2 aligns with the Resource-Based View, where internal capabilities, such as halal assurance systems and training, serve as strategic assets to manage institutional demands. RP3 integrates Institutional Theory and RBV by highlighting how internal processes respond to external certification variability through traceability systems. The supporting statements from interviewees across BPJPH, PERKOSMI, cosmetics companies, and material suppliers reinforce these linkages, ensuring the findings are theoretically consistent and empirically validated.

4.3. Conceptual framework interpretation

This section interprets the findings by synthesizing the core themes into a conceptual framework. Drawing from the research propositions and thematic analysis, it illustrates how key factors interact to shape halal traceability readiness within the Indonesian cosmetics sector.

Figure 8 illustrates the proposed conceptual framework developed from the empirical findings. The framework explains how institutional pressures influence halal traceability system readiness through three mediating constructs: adaptive compliance, organizational responsiveness, and traceability integration. Each arrow in the figure represents a directional relationship that is theoretically and empirically grounded in the data.

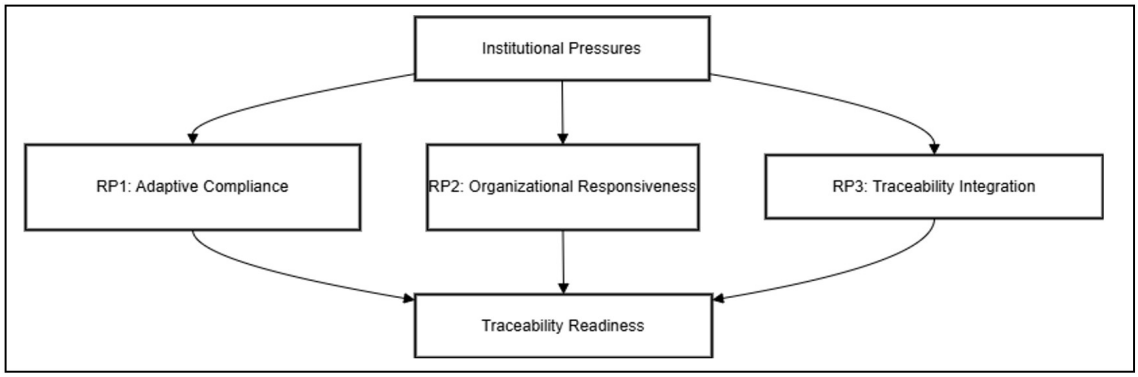

Figure 8. Proposed halal cosmetics industry traceability readiness conceptual framework.

Institutional pressures, which encompass coercive, normative, and mimetic forces, play a significant role in shaping organisations' traceability readiness. These external influences drive adaptive compliance by compelling firms to align their sourcing and certification practices with evolving regulatory expectations. For example, firms must manage critical materials more strictly and adopt procedures accommodating domestic and international halal

standards. This compliance adaptation forms the initial step toward building readiness. In parallel, institutional demands also influence organizational responsiveness. As firms face increased regulatory scrutiny, they must build internal capabilities such as halal training programs, staff certification, documentation routines, and structured audit mechanisms. These internal mechanisms represent the organisation's ability to respond proactively and systematically to external changes, ensuring that halal compliance is sustainable and repeatable. Organisational responsiveness emerges as a core internal buffer that enables firms to manage regulatory diversity more effectively. Traceability integration, the third mediating component, is likewise influenced by institutional pressures, particularly where transparency and digital infrastructure are concerned. Firms adopt traceability systems to synchronise data, track materials, and verify supplier compliance in real-time. These systems are essential for connecting halal certification's internal and external dimensions. Integration is achieved through centralised databases, linked compliance systems, and regular communication between departments and certifying bodies.

Importantly, these three components are not isolated. Adaptive compliance provides the regulatory foundation upon which organizational responsiveness is built. In turn, that responsiveness enables firms to integrate traceability systems effectively, ensuring operational continuity and transparent reporting. These interrelationships are also directional, as shown in Figure 8, and reflect a cascading influence from external pressures through internal adaptation toward full traceability readiness.

Ultimately, the combined effect of these dimensions contributes to a firm's ability to meet halal traceability requirements in a consistent and verifiable manner. In this context, traceability readiness reflects the organization's holistic capacity to ensure halal integrity across its supply chain. The arrows in the framework indicate not only sequence but also causality and interdependence, showing that readiness emerges from dynamic interaction among institutional expectations, internal processes, and technological capabilities.

4.4. Theoretical and empirical contributions

This study contributes to theoretical discourse and empirical literature by exploring how institutional pressures and internal capabilities influence traceability readiness in the halal cosmetics sector. The influence of coercive, normative, and mimetic pressures on adaptive compliance supports the propositions of Institutional Theory (DiMaggio & Powell, 1983), while adding sector-specific detail regarding certification complexity and material control elements that were underexplored in previous halal traceability research (Najmi et al., 2023). In contrast to prior studies, which primarily focused on the food sector (Hew et al., 2020)This research extends institutional theory and RBV application to the cosmetics sector, highlighting unique challenges such as imported material verification and certification variability. This sector-specific extension fills a gap in the halal traceability literature by illustrating how certification diversity and organizational responsiveness interact in non-food industries. Organisational responsiveness, grounded in RBV (Barney, 1991), is further elaborated by emphasizing dynamic routines such as internal audits, targeted training systems, and supplier partnerships as critical enablers for halal certification alignment—elements which previous works have not fully detailed within the cosmetics context. Moreover, this study offers a novel conceptualization of traceability integration, combining regulatory compliance and digital infrastructure into a cohesive operational system. Building on works such as Sumarliah et al. (2023) and Abd Rahman et al. (2023) it proposes a structured model linking institutional pressures to readiness outcomes, thereby advancing the theoretical understanding of halal traceability systems beyond the food supply chain. In summary, the theoretical contribution lies in extending Institutional Theory and RBV into a new industrial context: halal cosmetics. The empirical contribution lies in proposing an integrated model of halal traceability readiness supported by primary data from regulators, industry associations, manufacturers, and suppliers.

5. Conclusions

This study explores the determinants of halal traceability system readiness in the Indonesian cosmetics industry, focusing on certification variability, organizational capabilities, and traceability technologies. Using Institutional Theory to explain external pressures and the RBV to emphasize internal capabilities, the findings highlight how these factors collectively influence the industry's ability to maintain halal integrity and regulatory compliance.

Key findings demonstrate BPJPH's focus on regulatory oversight, PERKOSMI's emphasis on capacity-building, cosmetic companies' prioritisation of operational efficiency, and material suppliers' adaptability to compliance requirements. These dimensions collectively underline the need for an integrated approach to traceability systems. The study introduces the concept of traceability integration, which refers to the synchronization of material tracking, compliance protocols, and regulatory systems to enhance operational efficiency and ensure adherence to halal standards.

This research provides actionable insights for stakeholders. Organizations should actively implement adaptive compliance strategies, enhance responsiveness, and invest in integrated traceability systems to effectively manage certification variability and improve supply chain transparency. Policymakers are encouraged to harmonize regulations and support capacity-building initiatives to promote industry-wide standardization and sustainability.

While these contributions are valuable, several limitations should be acknowledged. As a qualitative study based on purposive sampling, the results are context-specific and not intended for statistical generalization. The data may also underrepresent challenges small and medium enterprises (SMEs) face, which often lack sufficient digital infrastructure and human resources to implement advanced traceability systems. Further research could examine concrete case examples or pilot implementations tailored to SME contexts. Additionally, although Institutional Theory and RBV underpin this study, future work should further validate these findings through broader sampling and quantitative methods such as Structural Equation Modeling (SEM), to capture better the relationships between institutional pressures, organizational capabilities, and traceability readiness.

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Data availability

Research data is not available.

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