

# Collaboration Towards A Sustainable Halal Industry Ecosystem: Pentahelix Approach

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**Abstract**– Indonesia continues to make significant strides toward becoming a key player in the global halal industry. Although the country possesses vast potential in this sector, the overall performance of the halal industry still faces various challenges and requires further enhancement. To realize this potential, strong and inclusive collaboration among all stakeholders is crucial in ensuring the long-term sustainability and global competitiveness of Indonesia’s halal ecosystem. This study seeks to explore and understand the roles of various stakeholders, namely the government, academics, business actors, media, and community groups in supporting the development of the halal supply chain in Indonesia. Using the Pentahelix model as a framework, this research emphasizes the importance of multi-stakeholder collaboration in building a robust and inclusive halal industry. Employing a qualitative descriptive approach through library research, the study reveals that each stakeholder within the Pentahelix framework holds a vital and strategic role in advancing the halal industry. The findings highlight the need for integrated and synergistic efforts among all parties to foster a sustainable halal ecosystem. Key challenges identified include the necessity for effective communication and coordination among stakeholders, as well as the need to leverage technological innovations in the halal supply chain.

**Keywords:** Sustainability, Halal Industry, Collaboration, Pentahelix

## 1. INTRODUCTION

The development of the Indonesian halal industry in the last 10 years has improved from various sides, both rankings and sectors supporting the halal industry. Based on the *Global Islamic Economy Indicator (GIEI)* Indonesia is consistently in 3rd place [1]. Indonesia is transforming into one of the world's halal producer centers and is one of the largest exporters of halal products. However, along with these achievements, Indonesia is also still listed as the top importer for OIC countries. As a form of acceleration in the halal industry, the government has a vision to make Indonesia the center of the World Halal industry. The development of the halal industry in Indonesia cannot be separated from the role of various parties both from the government and related stakeholders.

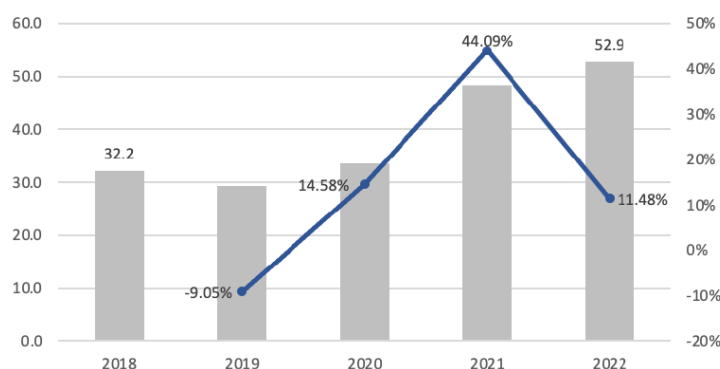


Figure 1. Trend of Indonesian Halal Product Exports [1]

The government plays an active role in the development of the halal industry through the implementation of strategic measures to optimize the potential of the sector [2]. As a form of mission in realizing Indonesia as the center of the halal industry, there are four strategies launched by the government which are the focus of challenges that must be faced such as increasing the productivity and competitiveness of the *halal* industry, implementing and strengthening policies and regulations, strengthening finance and infrastructure, strengthening *halal brands* and *awareness* [1]. To achieve the goals of the strategy that has been implemented, the government cannot carry out this task alone. It takes support from various related parties so that the halal industry can develop

well and sustainably. Cooperation between the government and various sectors is very important for the successful development of the halal industry. Sustainable contributions from these various sectors will accelerate the growth of the halal industry in the future [3].

The development strategy of the halal industry in Indonesia can be realized through improving the quality of superior human resources (HR), one of which is through a people development approach. Higher education has a crucial role in supporting this capacity building. Apart from producing competent graduates and experts in their fields, universities also bear the responsibility of producing quality research, including research that focuses on developing the halal product industry [4]. To strengthen the position of the national halal industry, meeting the needs of domestic halal products needs to be a top priority, so that Indonesian halal products can dominate the domestic market compared to imported halal products. Fulfilling these needs must be done sustainably, both for domestic and global markets, through the production of high quality halal products. In this case, the role of micro, small and medium enterprises (MSMEs) is very strategic, considering that MSMEs have the largest proportion and wide diversity of halal products in Indonesia. Therefore, strengthening the capacity of MSMEs in the halal industry needs to be encouraged through various efforts, such as the use of digital technology, increasing competitiveness, expanding market access, and easy access to capital. Optimizing the use of digital technology is also important to support productivity and production efficiency, so that MSMEs are able to contribute more significantly to the development of the national halal industry [5].

Optimizing digital technology as social media has a strategic role in supporting the development of the halal industry, especially in expanding promotional reach, increasing interaction with consumers, and building stronger relationships with a wider audience. In Indonesia, social media has contributed to increasing public awareness of halal products and services through the dissemination of relevant, interesting and informative content. This strategy not only influences public perception, but also plays a role in the consumer decision-making process. In addition, easy access to information, reviews and recommendations through digital platforms allows consumers to be more selective and critical in choosing halal products. Thus, optimizing social media can be one of the main drivers in realizing the sustainable growth of the halal industry in Indonesia [6].

The community as consumers of halal products also has a very important role in supporting the development of the halal industry. Education, availability of information media, and the application of a halal lifestyle allow the consumption level of halal products to increase. The increase in consumption of halal products encourages innovation in the halal industry is another step that can lead to the development of products, processes and technologies that are more environmentally friendly and sustainable [7]. The community can also play a role in terms of providing skilled labor in the halal industry through education and training programs, so that this industry is ready to face future challenges and needs. By strengthening the competence of human resources, the halal industry will be increasingly able to adapt and develop.

All stakeholders, including government, academics, business actors or industry, community media and have a role in the entire halal supply chain process. Collaboration between strategic elements in the halal industry can strengthen the halal supply chain ecosystem and encourage sustainable growth of the halal industry. Synergy between parties is the main foundation in realizing a credible and globally competitive halal supply chain. However, based on the results of the performance of the Indonesian halal industry, it shows that there is still a need for increased collaboration from various parties so that the halal industry can develop optimally and sustainably..

## **2. RESEARCH METHODOLOGY**

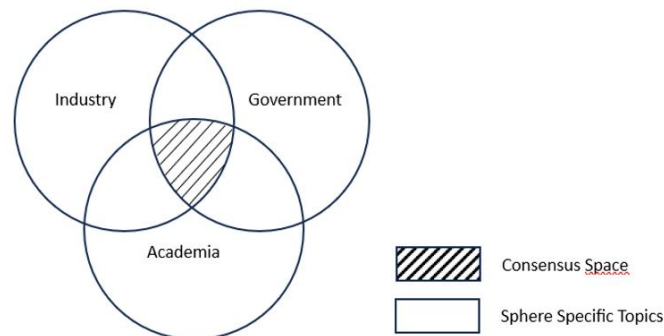
This study aims to identify and analyze the role of each stakeholder in the halal industry supply chain, which includes the government, academics, business actors, the community, and the media. This study uses a library research method with a descriptive qualitative approach. Data were collected through searching various relevant secondary sources, such as scientific journal articles, reports, and other credible documents that are directly related to the topic of study. All data obtained is analyzed thematically to identify contributions and patterns of collaboration between actors in supporting the sustainability and strengthening of the supply chain system in the halal industry. The data that has been collected is then analyzed and generalized to draw general conclusions regarding the pattern of collaboration between stakeholders in supporting the strengthening of the halal industry supply chain.

## **3. RESULTS AND DISCUSSION**

### **3.1 Pentahelix Model**

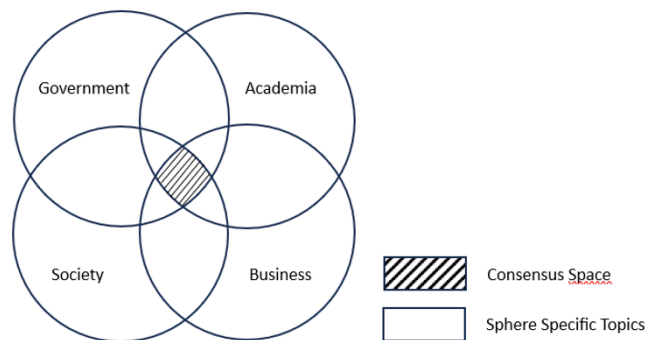
The study of collaborative, multi-actor approaches to addressing society's grand challenges is growing. One approach that has been widely developed is through the integrated helix innovation hub framework. The initial model of

this approach is known as the Triple Helix developed by [8]. The approach emphasizes the importance of synergy between universities, the industrial sector, and the government in responding to various social problems that exist in society.



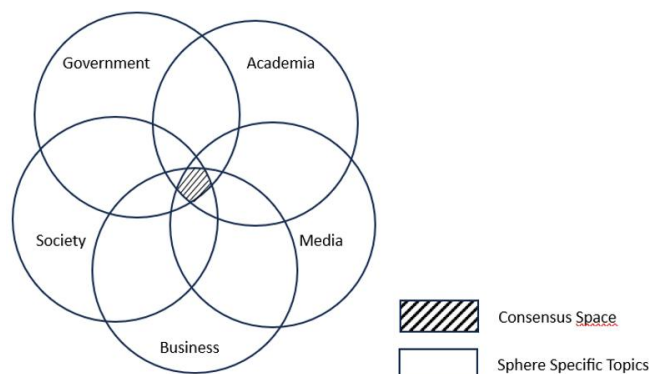
**Figure 2.** Triple Helix Model [9]

The Triple Helix approach was developed by adding other possible actors who could collaborate in solving social problems. As done by [10] expanded this concept by introducing the Quadruple Helix. This introduced concept adds a fourth dimension in the form of the role of civil society in shaping a more inclusive and contextual knowledge and innovation ecosystem. The Quadruple Helix approach has great potential in supporting sustainable development and meeting social-ecological needs through concepts such as eco-innovation and eco-entrepreneurship.



**Figure 3.** Quadruple Helix Model [11]

The Pentahelix model is an innovative development of the Quadruple Helix framework that integrates five main elements, namely academia, business or industry, community, government, and media in building a creativity and knowledge-based ecosystem. Collaboration between these stakeholders is seen as an effective strategy to optimize industrial development. Active involvement and synergy between actors are carried out by referring to their respective main roles and functions, thus creating an integrated approach in the development of the halal industry (halal industrial development).



**Figure 4.** Quadruple Helix Model

In the context of this research, the *Pentahelix* Model is used as an analytical framework to evaluate the form of collaboration between stakeholders in encouraging the development of the halal industry sector [12]. Halal supply chain management based on the *pentahelix* concept is a form of synergy between the five main elements, namely the government, academia, the industrial sector, the community, and the media. The development of the halal industry cannot be separated from the collaboration between the actors involved in this ecosystem. To engineer social change effectively, synergistic and integrated cooperation from various parties is needed, in order to encourage the progress and development of society in a sustainable manner. Synergy between stakeholders is very important to answer development challenges holistically, so as to create equitable progress in economic, ecological and social justice aspects. The dynamics in the development of the halal industry require readiness to face various challenges, including political.

The pentahelix model emphasizes multi-stakeholder involvement at every stage of halal industry development. This approach can have a long-term impact on economic, ecological and socio-cultural aspects. Active participation of stakeholders contributes to halal strategy planning that is more inclusive and widely accepted, so as to minimize the potential for conflict in policy implementation and unite the parties involved directly or indirectly in the halal industry. This is ultimately a supporting factor in order to realize the development of a sustainable halal ecosystem [13].

### **3.2 Stakeholders in the Pentahelix Model**

#### **a. Government**

The Penta Helix approach emphasizes the role of government in formulating regulations, guidelines, and policies to ensure the integrity of halal products and services [14]. The government's role in the halal industry can set and enforce halal certification standards and provide infrastructure support for halal logistics [15]. One of the important responsibilities carried out by the government is to formulate regulations that ensure the availability of halal food products for the community, as a form of protection of consumer rights, especially Muslims [16]. Muslims have the right to know and obtain certainty regarding the halalness of the products they consume. The guarantee of the halalness of this product is a form of state responsibility in providing protection and respect for the freedom of each individual in carrying out their religious teachings. The fulfillment of this right reflects the state's commitment to guaranteeing the rights of citizens, including the right of Muslims to consume halal products that are in accordance with the values of their beliefs [17].

The government has a crucial supervisory role in supporting the development of the halal industry ecosystem. The rise of imported products in circulation encourages the government and related parties to be more assertive in conducting supervision, so that products in the market meet the standards of eligibility and halalness. This supervision is important so that people can access products that are halal, safe and according to their needs [18]. One of the roles of the government in carrying out its supervisory role in the halal industry is the issuance of Law No. 33 of 2014 concerning Halal Product Guarantee which requires halal certification for products entering and trading in Indonesia. Entering the era of free trade as it is today, Indonesia is one of the main destinations for the entry of foreign products. Therefore, halal certification has a strategic role in the distribution process of imported products. For Muslim communities in Indonesia, understanding the halal status of a product is very important as part of the implementation of religious teachings in everyday life [17].

The application of the halal ecosystem concept in Indonesian government policies and regulations has a real impact on social and economic aspects. Therefore, the government needs to continue to encourage innovation and formulate policies that support the growth of the halal economy. These policies should be formulated adaptively, in line with the dynamics of global and domestic economic needs [19]. The development of policies that support the growth of the halal industry in Indonesia has great potential in increasing consumer confidence, strengthening the competitiveness of national products, and encouraging Indonesia's position as the center of the halal industry at the global level [20].

#### **b. Academics**

The role of academics can be done through several approaches such as in terms of human resources, research, education on halal supply chain management [14] and the development of new technologies and methodologies to improve the halal supply chain process [21].

##### **1. Human Resources**

Currently, the halal industry is showing rapid development in various sectors such as food, pharmaceuticals, fashion, cosmetics, tourism, as well as other sectors. This expansion reflects the high demand for halal products and services while opening up great opportunities for job creation. This potential makes the halal industry one of the drivers of economic growth and improving people's welfare through the provision of inclusive and sustainable employment opportunities [22]. To support the creation of a sustainable halal industry ecosystem,

strategic steps are needed to prepare competent and skilled human resources. This effort can be realized through increasing the capacity of the workforce, both in terms of knowledge and intellectual skills, technical expertise in the industrial field, and spiritual integrity. In this case, educational institutions, especially universities, have an important role in supporting the development of halal industrial human resources, one of which is through the implementation of professional certification programs. In addition, universities also play a role in producing graduates who are ready to contribute to the halal industry sector by providing supporting facilities such as laboratories, as well as adequate scientific infrastructure [23].

Improving the quality of education and training of human resources is the main key in strengthening the halal industry. This step includes a thorough understanding of halal products and raw materials, production processes according to halal principles, marketing strategies, to integrated supply chain management. The right knowledge and skills allow human resources to contribute to building a trusted and sustainable halal industry [24]. Higher education plays a strategic role as a supporting institution in developing human resources in the halal industry. Apart from producing competent professionals, universities can also act as halal study centers, halal product research and development platforms, and as a driving force for halal literacy in society. All of these roles make universities an important pillar in strengthening the sustainable halal industry ecosystem [25].

## **2. Halal Certification Institution**

The contribution of universities in the development of the halal industry is reflected in three main roles. First, as an implementer of human resource development through the existence and operationalization of the Halal Center. Second, as a facilitator of access to halal certification through an active role as an Halal Certification Intitution, which helps encourage wider application of halal standards in the business sector. Third, as a driver of halal product research and business incubators, especially for MSMEs, thus supporting the growth of an inclusive and sustainable halal industry. Higher education has a strategic role in strengthening the halal industry ecosystem in Indonesia through the establishment and management of the Halal Center. This institution not only functions as a center for halal studies, but also carries out the role of a Halal Certification Intitution which integrates a scientific approach with sharia principles. This role contributes significantly to strengthening the halal certification process in Indonesia [26].

Halal Certification Intitution is an institution that has the task of carrying out inspection and / or testing activities for the halalness of a product. LPH formed by the government can be under the auspices of ministries or state institutions, local governments, state universities, and state and regional owned enterprises. To date, the Ministry of Religious Affairs of the Republic of Indonesia has established around 150 collaborations in the form of agreements or memoranda of understanding (MoU) with various universities and institutions throughout Indonesia. This collaboration shows a shared commitment to strengthening a credible and sustainable halal product assurance system [27].

## **3. Halal Business Research & Incubation**

The development of research topics in the halal industry is an important part of the halal industry development strategy. Research in the halal industry can enhance the growth and sustainability of the halal industry through systematic exploration and advancement of knowledge related to halal practices, products and services. This includes topics such as halal regulations, certification, consumer preferences, market trends, and technological innovations. The results of research or studies conducted can help the government, industry, and society in making decisions and meeting the increasing demand of halal consumers. In addition, research can also help the growth and competitiveness of the halal industry by providing businesses and policymakers with a solid knowledge base and evidence-based strategies [24].

To develop the halal industry, research and development is necessary. Research and development in the halal sector can serve to ensure that the goods and services provided to society and consumed meet halal standards. Research and development in the field of Islamic economics can assist the industry in meeting market needs for halal goods and services. Research and development in the field of Islamic economics, especially in the halal industry, can also help increase efficiency in the industry, so that halal product producers can grow sustainably [27].

The role of academics or universities as an intellectual community is very strategic, because they function as a center for developing ideas and innovations, conducting research with the latest data on the halal industry development model, and providing relevant and useful technology for business actors. Universities can also carry out community service programs which include mentoring activities and technical guidance to business actors in order to support halal business development [28]. The availability of laboratory infrastructure and a knowledge base within universities is an important asset in supporting the halal product business incubation process, especially for Micro, Small and Medium Enterprises (MSMEs). To ensure the success of the incubation

process, close synergy between universities and industry players is needed, so as to create a fully integrated system [4].

Higher education has an important role in supporting the development of micro, small and medium enterprises (MSMEs) through the provision of business incubation facilities that are directed at developing halal products. Through this role, universities not only encourage the growth of sharia- based entrepreneurs, but also strengthen the halal industry ecosystem in a sustainable manner through mentoring, training, and strengthening the capacity of business actors [23]. Universities can conduct massive research that focuses on the halal industry and the impact of education that focuses on the halal industry. The results of the research conducted can provide a framework for policy makers to support academic programs that are in line with industry needs. Based on this, it is possible that the drive for innovation in the halal industry sector can start from universities [29].

#### **4. Strengthening Literacy**

Educational institutions, especially universities, play an important role in expanding knowledge and understanding of Islamic economics and finance, as well as aspects related to the halal industry [23]. Educational institutions can continue to develop educational programs that support the dissemination of knowledge about Islamic economics and halal practices, especially in facing the challenges of financial literacy and inclusion in the context of sharia [19]. As the center of education and the formation of future generations, universities need to strengthen collaboration with the industrial sector and play an active role in encouraging increased literacy and education related to Islamic economics and finance in the community. This role is an important foundation for the growth of a competitive and sustainable halal industry ecosystem [4].

The implementation of practices to create halal products in industry requires producers to have sufficient knowledge regarding the selection of halal raw materials, processing processes, halal control points, and the application of halal principles throughout the production process. Thus, knowledge of the halal concept is considered an important element to build a deep understanding of halal awareness, both among industry players and the general public [30].

#### **c. Business Actors**

Business actors play a strategic role in driving the growth of the halal industry. Increasing halal literacy and their understanding of halal products are important aspects that need to be developed. In addition, optimizing the role of the government in the halal certification process is needed to expedite halal registration procedures for business actors [31]. Through the utilization of halal certification, businesses are able to increase competitiveness, expand market reach, and build consumer confidence, which ultimately contributes to the growth of the halal industry at the national and global levels. Halal certification has a strategic role in strengthening product marketing efforts, opening access to international markets, and strengthening business positions. In addition, the application of sharia-based business management principles is considered important to ensure compliance with sharia provisions in every business activity. Thus, halal certification serves as a key factor in expanding market penetration and maintaining a competitive advantage in the halal industry sector [32].

Businesses in the restaurant and hotel sector that have adopted Muslim-friendly concepts and halal kitchens have shown a high awareness of the importance of halal certification. This certification is seen as a strategic element that supports business success, increases the number of tourist visits, and serves as an effective promotional tool. Therefore, considering the various benefits and positive impacts of halal certification, it is hoped that its application can be extended to various other business sectors [33].

Business actors in the micro, small and medium enterprise (MSME) sector have a very important role in supporting community welfare and encouraging Indonesia's economic growth. One of the efforts to expand employment opportunities is to develop micro, small and medium enterprises, which have labor-intensive characteristics and are able to create many jobs in proportion to the amount of capital invested. Along with the increasing awareness of the importance of halal certification as a guarantee of product compliance with halal standards, businesses are increasingly integrating halal principles in their production processes. This initiative not only facilitates product acceptance at various levels of society, but also contributes to the formation of a sustainable halal product ecosystem [34].

Awareness of the importance of this role has prompted the government to establish a halal certification policy aimed at business actors, both individuals and business entities. This policy aims to increase the competitiveness and selling value of Indonesian products in the global market. However, in its implementation, there are still various obstacles, both related to capacity building of MSEs themselves and in implementing the halal certification process [35]. Business groups, MSMEs, community organizations, NGOs, to product influencers, have an important role in strengthening and expanding the halal industry in Indonesia. Through various

advocacy, education, and networking activities, the community shows the importance of the role of society in driving the halal ecosystem. In addition, the growth of the Muslim middle class, including the 'Futurist Muslims' generation, provides new energy for the growth of the halal market, opening up broad opportunities for both large companies and MSMEs to develop together in this sector [36].

#### **d. Civil Society**

Civil society organizations can educate the public on the importance of halal integrity and drive consumer demand for certified halal products [21], [37]. Consumer awareness and satisfaction are key components of the halal supply chain, which influence the demand for halal products and supply chain integrity [38], [39]. The community plays an important role in maintaining the sustainability of the halal industry, not only as consumers, but also as agents of social change. By familiarizing ethical consumption patterns, the community helps create a fairer and more sustainable halal industry ecosystem. Support for decent work practices, concern for environmental sustainability, and encouragement for equitable distribution of welfare are part of the real contribution of the community in realizing a halal industry that is not only sharia compliant, but also brings broad benefits to life together [25].

In the midst of increasing public awareness of the importance of halal and sustainable lifestyles, ethical consumption is one of the tangible forms of consumer contribution to the halal industry. When consumers begin to be more selective in choosing products by paying attention to halal certification and producers' commitment to sustainability, they directly encourage the creation of a more responsible market [40]. Society also encourages innovation in the halal industry is another step that can lead to the development of more environmentally friendly and sustainable products, processes and technologies. By supporting innovation, the halal industry can continue to grow, bring more efficient and sustainable solutions, and meet people's expectations for products that are not only halal, but also environmentally friendly [7].

The community also plays a role as a provider of competent labor in the halal industry. The community must ensure that halal businesses apply fair labor principles, provide safe working conditions, and provide adequate wages for their workers. The community can also play an active role in ensuring that opportunities and resources in the industry are accessible to all, including marginalized groups. In this way, the halal industry not only develops economically, but also has a broader and more equitable impact, which not only reflects social justice, but also creates a foundation for sustainable and civilized economic growth [36]

#### **e. Media**

The rapid development of the global halal market is influenced by increasing consumer demand for halal products, technological advances, and intensive utilization of digital media. In this context, marketing strategies through social media play a crucial role in increasing interaction with consumers, strengthening business capabilities, driving business growth, and creating competitive advantages amid competitive market dynamics [41]. Advances in information and communication technology (ICT) have a significant impact on various sectors of life, including the Islamic business sector. The strategic role of ICT is reflected in its contribution to the growth and expansion of Islamic businesses including the halal industry, especially through optimizing functions such as marketing communications, expanding market share, and increasing operational efficiency [42].

The transformation of social media from a means of personal communication to a strategic communication tool in the business world has opened up great opportunities in supporting halal marketing activities. Social media provides convenience for consumers to access comprehensive information related to a product, allowing them to make wiser purchasing decisions. The phenomenon of halal marketing shows an increasingly widespread trend, where halal labeling is not only limited to food products, but also includes various other types of products that are now marketed with a sharia values-based approach [43].

Digital marketing is seen as one of the most effective communication strategies in marketing halal products in the modern era. Through the implementation of a targeted and relevant strategy, businesses can reach the Muslim community more optimally, while strengthening the effectiveness of halal product promotion. This strategy also contributes to the creation of sustainable customer relationships, which is an important factor in building consumer loyalty to halal products [44]. A significant increase in public awareness and understanding of halal issues in the current digital era cannot be separated from the role of social media which is used massively. As an information catalyst, social media accelerates the spread of understanding of the concept of halal, both from the aspects of products, processes, and regulations, thus supporting the formation of consumers who are more aware and critical of halal issues [45]. Social media serves as an effective socialization agent in transferring knowledge and information on halal industry principles and practices. Through various digital platforms, social media contributes to shaping public awareness, especially the Muslim community, of the importance of products and services that comply with Sharia. This role makes social media a strategic tool in building collective understanding and strengthening the culture of halal consumption in the community [46].

The development of halal literacy among the public is also driven by the existence of social media as a means of disseminating information. However, the amount of content and news that specifically discusses halal products and the development of the halal industry in digital media is still relatively limited. This condition shows the need to optimize the role of online media in supporting increased public knowledge and awareness of halal issues [47].

### 3.3 Benefits of Penta Helix in Halal Supply Chain

a. Increased Collaboration

By engaging various stakeholders, the Penta Helix model fosters a collaborative environment that can address the complexities of the halal supply chain more effectively [48].

b. Increased Resilience

Integration of diverse perspectives and expertise can help build a more resilient halal supply chain capable of handling disruptions and maintaining halal integrity [14].

c. Awareness Raising

Civil society and media engagement can significantly increase public awareness and demand for halal products, thus encouraging businesses to comply with higher standards [37], [21].

## 4. CONCLUSION

The Pentahelix approach in the halal supply chain illustrates the importance of collaboration between government, business people, academics, society and the media in developing a sustainable halal industry. The roles and interests of each party can be synergized so that the supply chain process in the halal industry can run properly. Collaboration between parties certainly has various challenges that must be faced, such as aspects of regulatory compliance. All parties need to ensure that all stakeholders comply with established halal regulations and standards. This is very important to maintain the integrity of the halal supply chain [15], [14]. Therefore, effective communication and coordination among stakeholders is essential for collaboration in this Penta Helix model [48]. Parties can also start to adopt advanced technologies such as AI and *big data* to help manage the complexity of the halal supply chain. However, this requires investment and human resource expertise that has the capacity [49]. The application of the Penta Helix model provides an opportunity to increase consumer satisfaction, sustainable business growth, and improved performance in the halal industry [39], [50], so future research can use this approach for the model.

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