

**DATA-DRIVEN CONSUMER'S DEMAND PREDICTION
AND CONTEXTUAL ANALYSIS TO ENHANCE AGILE
MARKETING FOR HALAL FOOD PRODUCT
TRADE BETWEEN THAILAND AND CHINA
VIA E-COMMERCE PLATFORMS**



CHAOWAPARK SRIKASEM

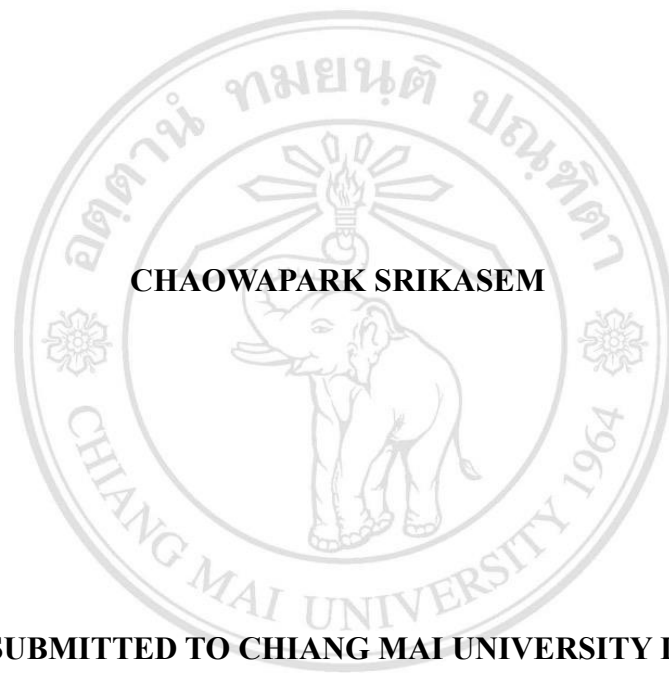
**DOCTOR OF PHILOSOPHY
IN DIGITAL INNOVATION AND FINANCIAL
TECHNOLOGY**

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AUGUST 2024

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**A THESIS SUBMITTED TO CHIANG MAI UNIVERSITY IN PARTIAL
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IN DIGITAL INNOVATION AND FINANCIAL TECHNOLOGY**

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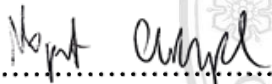
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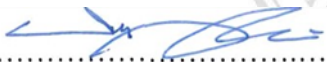
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24 August 2024

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DEDICATED TO

My adorable family especially my father (late) who always appreciated and supported me by believing in my abilities and My Mother who always wanted to see my future as shiny as stars. I further want to dedicate this thesis to my most respected teacher Asst. Prof. Dr. Noppasit Jakpitak who always burn like a candle to give light to his students. I could not have completed this thesis without their loyalty and support.



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Bismillah al-Rahman al-Rahim

"In the name of God, the Most Gracious, the Most Merciful."

In the name of Allah, the Most Gracious and the Most Merciful. All praises to Allah Almighty, the all Hearing, the all Knowing, the most Gracious, the most Merciful, the Creator, the Master of the Day of Judgment. He blessed me with knowledge, courage, patience, and strength to complete this study. During this endeavour, His countless blessings and everlasting favours instilled in me the inspiration, optimism, and enthusiasm. Countless prayers upon Prophet Muhammad (صلى الله عليه وسلم), the greatest teacher of the world.

As a Muslim of Thai and Chinese descent with over 20 years of experience in marketing and advertising across various sectors, both locally and globally, my curiosity and passion for learning have driven me to seek new knowledge during this transformative period of global change. This is an exciting era where digital technologies are creating new opportunities for business growth. Many innovative unicorns are emerging, driving global demand, GDP, and enhancing our quality of life. Digital advancements in FinTech, AI, and data are providing unexpected experiences and pushing the boundaries of creativity.

I am particularly interested in the strategic role of the new world economic driver, China. China's rise as a global leader is evident through its Belt and Road Initiative (BRI) and the substantial consumption potential of its 1.4 billion population. The Chinese market presents immense opportunities if navigated effectively.

As a Muslim in Thailand, where Islam is a minority religion, I am also inspired by the significant economic impact of the global Muslim population. Reports indicate that almost two billion Muslims contribute trillions of US dollars to the global economy through their consumption patterns. These three global economic drivers—digital transformation, China's economic rise, and the Muslim consumer market—have inspired me to pursue my PhD research on the topic, “Data-Driven Approach to Raise the Marketing and Trade Strategy based on Halal Food Product Transactions in the China

Market.” I aim to provide valuable insights to the Islamic communities in Thailand, the ICDI faculty at Chiangmai University, and Thai policymakers to support national growth.

I would like to express my deepest gratitude to my mother, Mrs. Ratana Salamah Srikasem, whose daily gesture of making black coffee fuels my belief in my potential. Her pride continues to drive me forward. To my father, Sergeant Chalor Srikasem, who always supported me, your presence is felt even today. To my brother, Almulhume Abdul Kareem Srikasem, your love remains with me. To my four nephews and nieces (Ushrof, Serene, NurIna, and Anut Srikasem), I hope my educational journey demonstrates that passion for learning brings wisdom and a bright future.

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Chaowapark Srikasem

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หัวข้อคุณิพนธ์ การคาดการณ์อุปสงค์ของผู้บริโภคที่ขับเคลื่อนด้วยข้อมูลและการวิเคราะห์ที่บริบทเพื่อส่งเสริมการตลาดที่คล่องตัวสำหรับการค้าผลิตภัณฑ์อาหารฮาลาลระหว่างไทยและจีนผ่านแพลตฟอร์มอีคอมเมิร์ซ

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บทคัดย่อ

วิทยานิพนธ์ฉบับนี้ศึกษาการคาดการณ์ความต้องการของผู้บริโภคที่ขับเคลื่อนด้วยข้อมูลและการวิเคราะห์เชิงบริบทเพื่อเสริมกลยุทธ์การตลาดที่คล่องตัวสำหรับการค้าขายอาหารฮาลาลระหว่างประเทศไทยและจีนผ่านแพลตฟอร์มอีคอมเมิร์ซ โดยเน้นการเติบโตอย่างมีนัยสำคัญของตลาดฮาลาลทั่วโลก ซึ่งได้รับแรงขับเคลื่อนจากการเพิ่มขึ้นของประชากรมุสลิมและความต้องการผลิตภัณฑ์ที่ได้รับการรับรองฮาลาล งานวิจัยนี้เน้นบทบาทของประเทศไทยในฐานะผู้ผลิตอาหารฮาลาลชั้นนำและความสนใจที่เพิ่มขึ้นของตลาดจีนในผลิตภัณฑ์ฮาลาลจากการขยายตัวของโครงการ Belt and Road Initiative (BRI)

การศึกษานี้ใช้แบบจำลองการตลาด 5.0 ของ Philip Kotler ร่วมกับ STP model ที่ได้ใช้ทำการวิเคราะห์ด้วยการนำเทคโนโลยีดิจิทัล มาใช้เก็บข้อมูล การรวบรวมข้อมูลและการดึงข้อมูลจากแพลตฟอร์มอีคอมเมิร์ซจีน การวิเคราะห์ยอดขายและการวิจัยเชิงบริบทของลูกค้าด้วยการนำโมเดลการพยากรณ์และแบบจำลองการเรียนรู้มาใช้ทำนายความต้องการของผู้บริโภคในอนาคต ผ่านเครื่องมือการทำนายเช่น LSTM, BiLSTM และ XGBoost เพื่อผลการทำนายที่แม่นยำ โดยการวิเคราะห์บริบทจากปัจจัยทางสังคมเศรษฐกิจและวัฒนธรรมที่กว้างขึ้นที่มีผลต่อพฤติกรรมของผู้บริโภค ทำให้เกิดประโยชน์จากข้อมูลเชิงลึกในการพัฒนากลยุทธ์การตลาด (Agile marketing) ที่มุ่งเน้นการปรับและตอบสนองตัวอย่างรวดเร็ว

งานวิจัยนี้ค้นพบปัจจัยชี้วัดและผลการวิจัยที่สำคัญแสดงให้เห็นว่าอาหารแปรรูปและเครื่องดื่มเป็นผลิตภัณฑ์ฮาลาลที่ขายดีที่สุด สร้างรายได้สูงสุดในตลาด การวิเคราะห์การขายเชิงพยากรณ์แสดงอัตราการเติบโตที่คาดการณ์ไว้ที่ 6.1% ต่อปี โดยตลาดอาหารฮาลาลคาดว่าจะมีมูลค่า 2.8 ล้านล้านดอลลาร์ภายในปี 2025 การศึกษาเน้นว่ายอดขายเพิ่มขึ้นอย่างมากในช่วงเทศกาล โดยเฉพาะเดือนรอมฎอนและวันตรุษอิดิลฟิตรี โดยยอดขายหลังรอมฎอนมีการเติบโตเพิ่มขึ้นอย่างไม่คาดคิดถึง 80 ล้านหยวน วิทยานิพนธ์ฉบับนี้และบทสรุปผลการวิจัย สามารถนำผลลัพธ์ที่ได้มาใช้เพื่อการสร้างแผนกลยุทธ์การตลาดที่คล่องตัวได้อย่างมีประสิทธิภาพ โดยสามารถแสดงให้เห็นว่าการวิเคราะห์เชิงพยากรณ์สามารถให้ข้อมูลในการพัฒนากลยุทธ์การตลาดที่ยืดหยุ่นและตอบสนองได้อย่างไร และเน้นศักยภาพในการส่งเสริมการลงทุนผลิตและส่งออกผลิตภัณฑ์อาหารฮาลาลของไทยเข้าสู่ตลาดจีนได้อีกหนึ่งทางเลือกที่มีศักยภาพ ซึ่งจะสร้างการเติบโตทางเศรษฐกิจและส่งเสริมความสัมพันธ์ทางการค้าแบบทวิภาคีผ่านกลยุทธ์อีคอมเมิร์ซได้อย่างมีประสิทธิภาพ.



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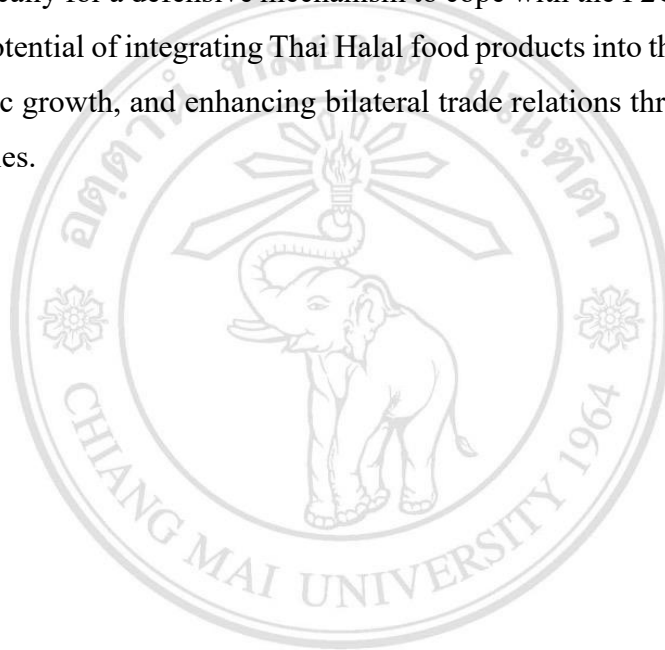
Dissertation Title	Data-Driven Consumer's Demand Prediction and Contextual Analysis to Enhance Agile Marketing for Halal Food Product Trade Between Thailand and China Via E-Commerce Platforms	
Author	Mr. Chaowapark Srikasem	
Degree	Doctor of Philosophy (Digital Innovation and Financial Technology)	
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ABSTRACT

This thesis explores data-driven consumer demand forecasting and contextual analysis to optimize agile marketing strategies for the Halal food trade between Thailand and China through e-commerce platforms. It emphasizes the substantial growth of the global Halal market, fueled by the expanding Muslim population and the increasing demand for Halal-certified products. The research highlights Thailand's prominent position as a leading Halal food producer and China's rising interest in Halal products, supported by the Belt and Road Initiative (BRI).

The study integrates Philip Kotler's Marketing 5.0 model with the Segmentation, Targeting, and Positioning (STP) framework, enhanced by data-driven technologies such as web crawling and web scraping. Predictive analytics and machine learning models, including LSTM, BiLSTM, and XGBoost, are employed to forecast consumer demand accurately. Contextual analysis examines broader socio-economic and cultural factors influencing consumer behavior, providing insights into developing targeted and adaptive marketing strategies.

Key Result findings reveal that processed food and beverages are the best-selling Halal products, generating the highest revenue within the market. Predictive sales analysis shows a projected growth rate of 6.1% annually, with the Halal food market expected to reach \$2.8 trillion by 2025. The study also highlights that sales surge significantly during festive periods, particularly Ramadan and Eid al-Fitr, with post-Ramadan sales showing unexpected growth of 80,000,000 Yuan. The results have been concluded by aligning the results with agile marketing strategies, demonstrating how predictive analytics can inform the development of flexible and responsive marketing campaigns specifically for a defensive mechanism to cope with the F2C business models. It highlights the potential of integrating Thai Halal food products into the Chinese market, fostering economic growth, and enhancing bilateral trade relations through optimized e-commerce strategies.



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LIST OF ABBREVIATIONS

BRI	Belt and Road Initiative
STP	Segmentation, Targeting, and Positioning
LSTM	Long Short-Term Memory
BiLSTM	Bidirectional Long Short-Term Memory
XGBoost	Extreme Gradient Boosting
NLP	Natural Language Processing
CBEC	Cross-Border E-Commerce
GDP	Gross Domestic Product
HOS	Halal Orientation Strategies
FP	Financial Performance
HFC	Halal Food Companies
HC	Halal Culture
SSP	Sustainable Strategic Planning
IFDI	Islamic Financial Development Index
AI	Artificial Intelligence
ICT	Information and Communication Technology
SEM	Structural Equation Modeling
fsQCA	Fuzzy Set Qualitative Comparative Analysis
CICOT	Central Islamic Council of Thailand
HSIT	Halal Standard Institute of Thailand
DITP	Department of International Trade Promotion
TAT	Tourism Authority of Thailand

ข้อความแห่งการริเริ่ม

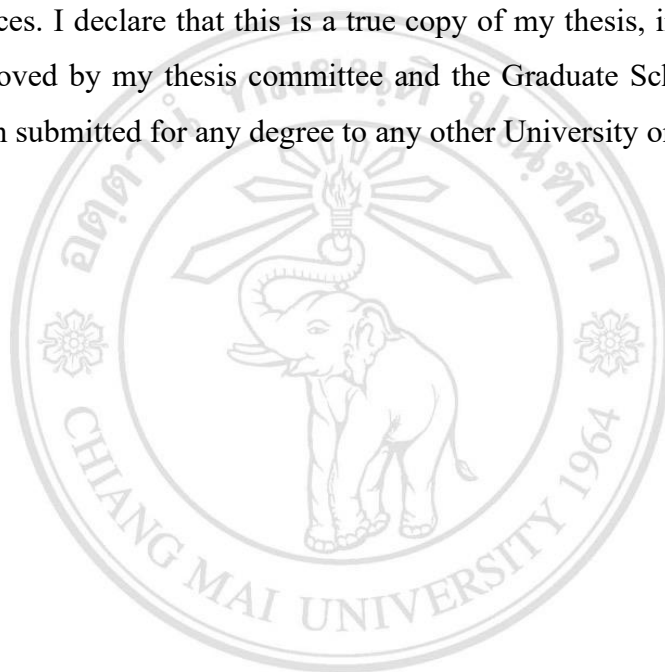
ข้าพเจ้าขอรับรองว่า ตามความรู้ที่ดีที่สุดของข้าพเจ้า วิทยานิพนธ์ฉบับนี้ไม่ละเมิดลิขสิทธิ์ของผู้อื่นหรือสิทธิในทรัพย์สินใด ๆ และแนวคิด เทคนิค คำอ้างอิง หรือเนื้อหาอื่นใดจากงานของผู้อื่นที่ถูกรวมอยู่ในวิทยานิพนธ์ฉบับนี้ ไม่ว่าจะป็นงานที่ได้รับการตีพิมพ์หรือไม่ก็ตาม ได้รับการอ้างอิงอย่างถูกต้องตามหลักการอ้างอิงมาตรฐาน ข้าพเจ้าขอประกาศว่านี่คือสำเนาที่แท้จริงของวิทยานิพนธ์ของข้าพเจ้า รวมถึงการแก้ไขขั้นสุดท้ายตามที่ได้รับอนุญาตจากคณะกรรมการวิทยานิพนธ์และบัณฑิตวิทยาลัย และวิทยานิพนธ์ฉบับนี้ไม่เคยถูกยื่นเพื่อขอรับปริญญาจากมหาวิทยาลัยหรือสถาบันอื่นใดมาก่อน



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CHAPTER 1

INTRODUCTION

1.1 Background

In recent years, the global Halal food market has seen substantial growth, driven by increasing Muslim populations and rising demand for Halal-certified products. Thailand and China, two significant players in the global trade arena, have recognized the potential of the Halal food sector. Referring to the Ministry of Commerce Thailand and Think Halal Think Thailand, the Thai Halal food has established its reputation as a leading Halal food producer (Ministry of Commerce, 2019). China with its vast consumer base and growing interest in Halal products, are poised to benefit from enhanced trade relations facilitated by e-commerce platforms (Bernoussi and Belkiziz, 2024). E-commerce has revolutionized trade by providing a seamless, efficient, and expansive marketplace for Halal food products, overcoming traditional barriers and enabling direct consumer engagement. This research delves into data-driven consumer demand prediction and contextual analysis to bolster agile marketing strategies within this bilateral trade framework (Figure 1.1).

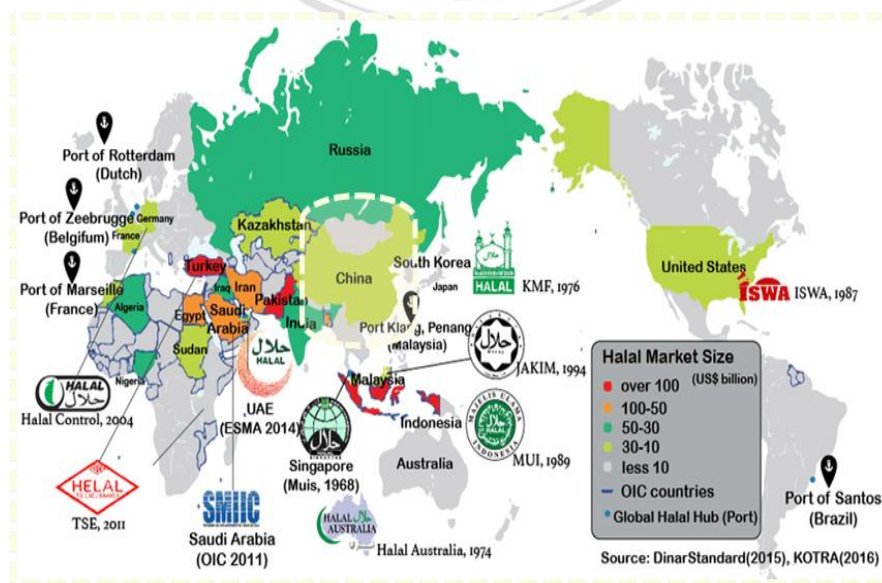


Figure 1.1 World-wide spread of Halal market. Source; (Park, 2017)

1.1.1 Global Halal Market

The evolution of the global Halal market examines its origins, development, and current dynamics. It highlights how the Halal market has grown from traditional practices to a complex, global industry influenced by neoliberalism and religious fundamentalism. The commercial use of Halal now explores various sectors beyond food, including cosmetics and pharmaceuticals. It also addresses the standardization of Halal practices and the involvement of diverse actors, from religious leaders to global corporations. In the Quran, Halal means lawful, referring to things (such as food) and sometimes institutions (such as marriage) that are permitted by God in contrast to what is forbidden (haram). The Halal market standard is a commercial use of Halal that extends beyond religious practices to encompass a consumption regime for Muslims globally. It involves standardizing various products and services (food, cosmetics, medicines, etc.) according to Halal guidelines, thus creating a market that caters to the specific needs of Muslims and integrates them into the global economy (Halal, 2016).

The rapid growth and expansion of the global Halal market is on the verge of excellence, which is now valued at approximately USD 2.3 trillion annually (Quadri et al., 2023). Initially focused on food, the market has extended to include cosmetics, pharmaceuticals, logistics, and tourism. Key factors driving this expansion include a growing Muslim population, increasing economic power in Muslim-majority countries, and the rising demand for Halal products in non-Muslim countries (Quadri et al., 2023). Countries like Malaysia, Brazil, and Australia are leading players in various Halal sectors. The Halal market's annual growth rate is 20%, reflecting both its economic potential and the growing consumer base worldwide (Table 1.1).

Table 1.1 GDP and population of top 15 Muslim countries (2018-2023)., Source: <http://www.muslimpopulation.com>

Countries	GDP (PPP Billion US\$)						Population (Million)					
	2018	2019	2020	2021	2022	2023	2018	2019	2020	2021	2022	2023
Indonesia	3600	3700	3800	3900	4000	4100	270	275	280	285	290	295
Saudi Arabia	3400	3450	3500	3550	3600	3650	33	34	35	36	37	38
Turkey	2300	2350	2400	2450	2500	2550	81	82	83	84	85	86
Iran	1700	1720	1750	1780	1800	1820	82	83	84	85	86	87
Nigeria	1200	1250	1300	1350	1400	1450	190	195	200	205	210	215
Egypt	1300	1320	1350	1370	1400	1420	98	99	100	101	102	103
Pakistan	1100	1150	1200	1250	1300	1350	213	216	220	223	226	229
Malaysia	900	920	940	960	980	1000	32	33	34	35	36	37
United Arab Emirates	700	720	740	760	780	800	10	10	11	11	11	12
Bangladesh	800	820	840	860	880	900	161	163	165	167	169	171
Iraq	500	520	540	560	580	600	39	40	41	42	43	44
Algeria	600	610	620	630	640	650	42	43	44	45	46	47
Kazakhstan	400	410	420	430	440	450	18	19	20	21	22	23
Qatar	200	210	220	230	240	250	3	3	3	3		3
Morocco	100	110	120	130	140	150	36	37	38	39	40	41

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The Halal market, initially confined to food, now includes sectors like cosmetics, pharmaceuticals, logistics, and tourism. It is valued at USD 2.3 trillion annually, with an annual growth rate of 20%. Key drivers are a growing Muslim population, rising GDP in Muslim-majority countries, and demand in non-Muslim countries (Menne et al., 2023). Non-Muslim countries like Brazil and Australia are significant players in the Halal food market. The market's expansion is supported by ethical values appealing to both Muslims and non-Muslims. The Halal industry's growth is propelled by increasing awareness and demand for Halal-certified products globally. Emerging markets in countries like China, Thailand, and the USA show potential for substantial growth in various Halal sectors (Azam & Abdullah, 2020).

1.1.2 Muslim Population and Its Impact on GDP Growth

The significant growth in the Muslim population from 2010 to 2050, with an increase from 1.6 billion to 2.76 billion, represents a rise in global share from 23.2% to 29.67% (Table 1.2). This substantial growth suggests an expanding consumer base, which can drive economic development by increasing demand for products and services tailored to Muslim preferences (Lipka & Hackett, 2017).

Table 1.2 Comparison of population growth and its projection till 2050
(Lipka & Hackett, 2017).

Religion	Population (billions)		Raise in Population	Percentage Raise	
	2010	2050	2010-2050 (billions)	2010	2050
Christians	2.2	2.9	0.7	21%	30%
Muslims	1.6	2.7	1.1	24%	29%
Faithless Religion	1.1	1.2	0.1	16%	17%
Hindu	1	1.4	0.4	15%	19%
Buddhist	0.5	0.5	0	9%	5%

According to the PEW 2011, Muslim population growth can be distributed and analysed based upon the continental regions (Table 1.3). The Asia-Pacific region (including ASEAN and non-ASEAN countries) remains the largest, growing from 1 billion to nearly 1.3 billion, though its global population share has decreased slightly from 62.1% to 59.2%. The Middle East and North Africa, and Sub-Saharan Africa, see notable increases, with the latter's global share rising from 15.0% to 17.6%. Europe's Muslim

population grows modestly, maintaining a 2.7% global share, while the Americas see a small increase from 0.3% to 0.5%. (Can, 2022).

Table 1.3 Continental distribution of the Muslim population and its growth projection till 2030 (Can, 2022)

Region	Population (billions)		Global Share (%)	
	2010	2030	2010	2030
Asia-Pacific	1	1.2	45	50
Middle East and North Africa	0.4	0.6	20	25
Sub-Saharan Africa	0.3	0.5	15	20
Europe	0.05	0.07	6	8
Americas	0.01	0.01	2	2

Since the largest Muslim community resides in the Asia-Pacific region, hence a good site to target for the Halal Food Market projection. China's Halal food market is experiencing significant growth due to its substantial Muslim population and the Belt and Road Initiative (BRI), which enhances trade and cultural exchanges with Muslim-majority nations (Hidayat et al., 2022; Rafiki et al., 2021). The BRI promotes the integration of the Halal food supply chain, boosting the import/export of Halal products and positioning China as a key player in the global Halal market. The sector's resilience during the COVID-19 pandemic underscores its potential, with projections estimating the Halal food market will reach \$1.38 trillion by 2024 (Li, 2018; Masood & Rahim, 2021). The BRI's emphasis on infrastructure, trade, and digital transformation aligns China's interests with those of the global Muslim community, fostering growth and cooperation (Holmes, 2018).

1.1.3 Value of Halal Market in Islamic Economy

Butt and co-workers investigated the impact of Islamic finance on economic growth using the Islamic Financial Development Index (IFDI) across 67 countries from 2012 to 2020. Their findings indicated that Islamic finance significantly contributes to economic growth, particularly in Muslim-majority and developing nations, compared to non-Muslim and developed countries (Butt et al., 2023). Key aspects supporting Islamic economic growth include the robust performance of Islamic finance during crises, the positive correlation between Islamic financial development and GDP growth, and the

rapid expansion of Islamic banking and capital markets. Their study suggests that regulators should enhance Islamic finance to foster economic growth, emphasizing the importance of public awareness and comprehensive development of the Islamic financial sector.

Xiong and Chia explored the Halal food experiences of both Muslim and non-Muslim tourists in Yuanjia Village, China, revealing that Halal food is an appealing attraction even in non-Islamic destinations. It identifies six themes—abundant choices, value for money, reassuring options, sensory pleasure, unique charm, and religious value. Muslim tourists valued the reassuring options and religious significance of Halal food, while non-Muslim tourists appreciated the variety, affordability, sensory enjoyment, and cultural uniqueness. Their study underscores the potential of Halal food in enhancing destination appeal and enriching tourist experiences (Xiong & Chia, 2024), which highlights Halal food's crucial role in providing Muslim tourists with reassuring options that meet religious dietary requirements, thus making them feel secure and satisfied (Ahmed Osman, 2023). Additionally, Halal food's hygienic, healthy, and high-quality nature is appreciated by both Muslim and non-Muslim tourists, enhancing the overall appeal and experience of the destination (Tao et al., 2023). The global Halal industry is rapidly expanding, driven by awareness campaigns and increasing demand for Halal products and services across various sectors, including food, tourism, and pharmaceuticals (Figure 1.2).

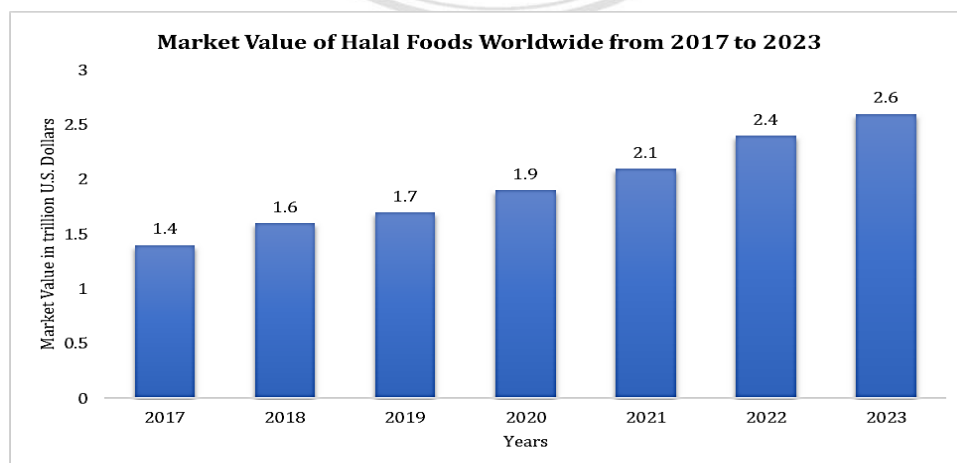


Figure 1.2 World-wide market value and projection of Halal food

Both Muslim-majority countries like Malaysia and Indonesia and non-Muslim countries like Thailand and China show substantial potential, with emerging market players and cities like Yiwu in China and the US Halal market contributing significantly to consumer spending and projected sales of up to \$2.43 trillion by 2027 (Figure 1.3) (Mula et al., 2013).

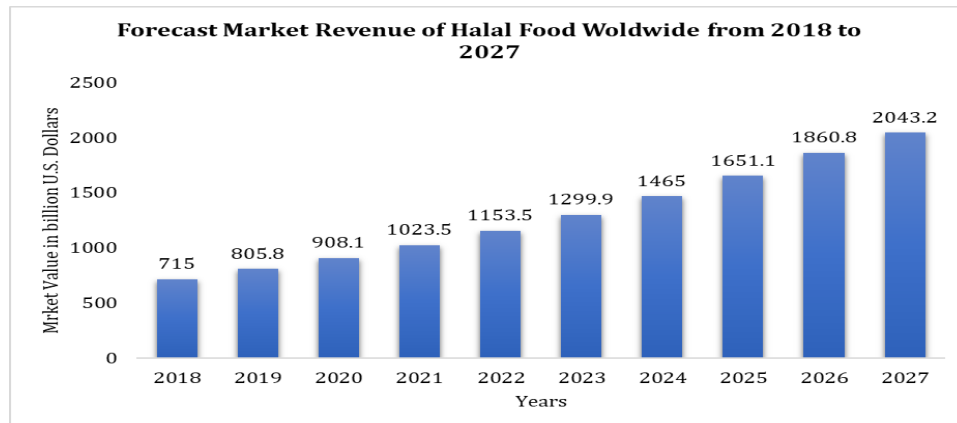


Figure 1.3 World-wide market forecast for Halal food revenue

1.1.4 Major Stakeholders in Halal Food Market

Amini and co-workers provided a comparative analysis of Halal food product competitiveness between Singapore and Thailand in Southeast Asia (Figure 1.5). Singapore targets a broader global market with innovative marketing strategies, while Thailand focuses on the regional market, emphasizing local wisdom and traditional wealth. Their study highlights the cost-effectiveness of Thai Halal food products, as Thailand benefits from lower production costs and abundant local raw materials, enabling a diverse and economically efficient Halal food industry (Amini et al., 2023). Thailand's Halal food products are well-received due to the significant Muslim population and the government's robust support for the Halal industry, making it a leading exporter in the region. Both countries place high importance on Halal certification to ensure consumer trust and market competitiveness.

Table 1.4 Ranking of 10 countries on Halal food products in the world

Countries	Number of Halal Products	Quality Ranking Score
Singapore	9	65.1
Thailand	20	59.2
United Kingdom	25	55.0
South Africa	30	51.0
France	31	48.2
Belgium	32	47.5
Hong Kong	33	47.5
USA	34	47.3
Spain	35	46.5
Taiwan	36	46.2

The global Halal food sector categorizes its traded products into three main groups: confectionery, bakery products, and processed food and beverages, as illustrated in (Figure 1.4). From 2014 to 2024, the "processed food and beverages" category has consistently generated the highest revenue within the Halal food market (Can, 2022). Bakery products follow as the second-highest revenue-generating group, while confectionery ranks lowest in terms of income. By 2024, the processed food and beverages category is projected to generate \$1.75 billion in revenue within the Halal food sector.

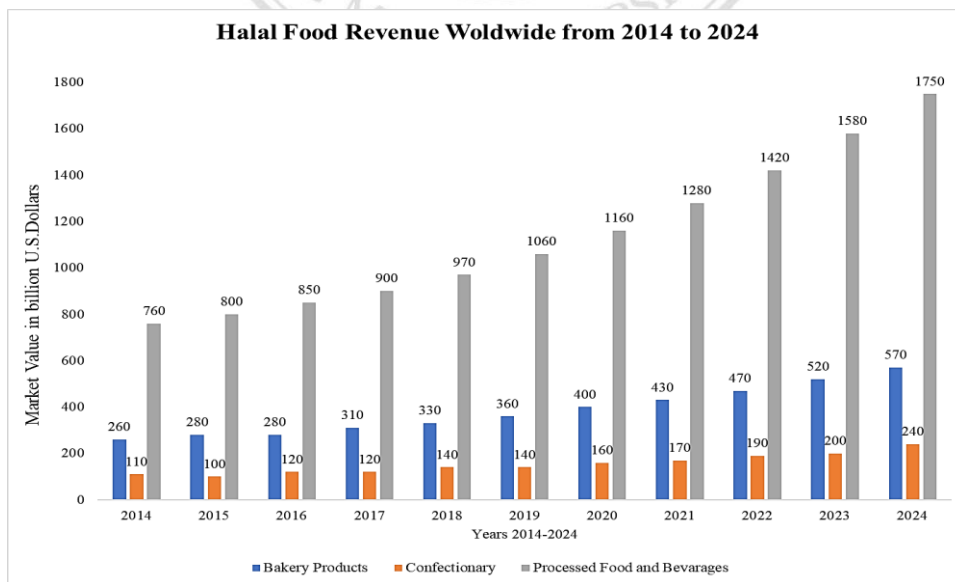


Figure 1.4 Halal Food Revenue Worldwide from 2014 to 2024 by Category (Can, 2022)

1.1.5 Role of Belt and Road Initiative in Chinese GDP Growth and E-Commerce Trade

The rapid growth of China's GDP has been significantly influenced by the Belt and Road Initiative (BRI). The BRI, introduced in 2013, aims to enhance regional cooperation through policy coordination, trade facilitation, and infrastructure development. This initiative has bolstered China's import volumes, increasing the value from \$1,818.4 billion in 2012 to \$2,686.7 billion in 2021, with an average annual growth rate of 6.1%. The market share of products from BRI countries in China's total imports grew from 24.1% in 2013 to 28.7% in 2021. The BRI has promoted a 28% increase in China's imports from participating countries, highlighting its effectiveness in enhancing trade logistics and reducing trade costs. This initiative has also improved bilateral maritime connectivity, which has increased by 1.76% due to BRI projects, further facilitating trade between China and BRI countries (Lu et al., 2024). Additionally, the BRI has contributed to the optimization of China's import structure by encouraging the entry of new products and the exit of existing ones, thus boosting market efficiency and trade diversity. Overall, the BRI's emphasis on building an interconnected trade network and enhancing economic cooperation has been crucial in driving China's rapid GDP growth and expanding its import markets.

China's Digital Economy, valued at 5.4 trillion USD and ranked second globally in 2020, has seen minimal impact from COVID-19, while the Belt and Road Initiative (BRI), connecting over 70 countries including Muslim nations, remains a cornerstone of China's economic strategy. President Xi Jinping's 2013 announcement of the BRI aimed to foster multi-dimensional cooperation and strengthen ties across Asia, Europe, and Africa (Figure 1.5) (Bruni, 2019). The significant partnerships and bilateral agreements between China and Muslim countries underscore the strategic importance of these connections (Figure 1.5). (Selmier, 2018; Yau et al., 2020).

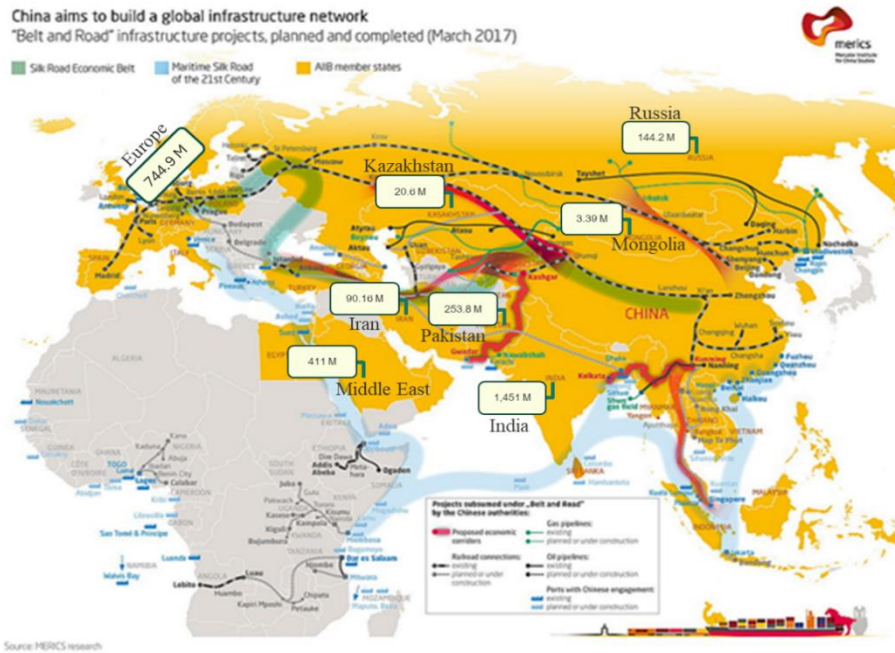


Figure 1.5 Oceanic and land routes of BRI and SREB China with Asia, Europe, and Africa. (Bruni, 2019)

The BRI is crucial in promoting the integration of Halal food supply chains, enhancing the import and export of Halal-certified products, and fostering trade and cultural exchanges between China and predominantly Muslim countries. As mentioned by Chaowapark and co-workers, this initiative significantly boosts the availability and variety of Halal food in China, positioning the country as a pivotal player in the global Halal food market and supporting the overall growth and resilience of the Halal industry (Srikasem et al., 2024).

The Belt and Road Initiative (BRI) significantly enhances cross-border e-commerce (CBEC) between China and Thailand, promoting mutual economic growth (Majcherczyk & Shuqiang, 2019). The BRI's Digital Silk Road component focuses on improving both physical and digital infrastructure, facilitating smoother and faster trade. Chinese government initiatives, including tax compensations and the development of Free Trade Zones, support Thailand's B2B business model, boosting e-commerce activities. Infrastructure projects, like the China-Pakistan Economic Corridor, exemplify efforts to enhance connectivity. This cooperation leads to reduced trade costs and increases bilateral trade, underscoring the BRI's role in stabilizing and expanding CBEC between the two nations (Figure 1.6).

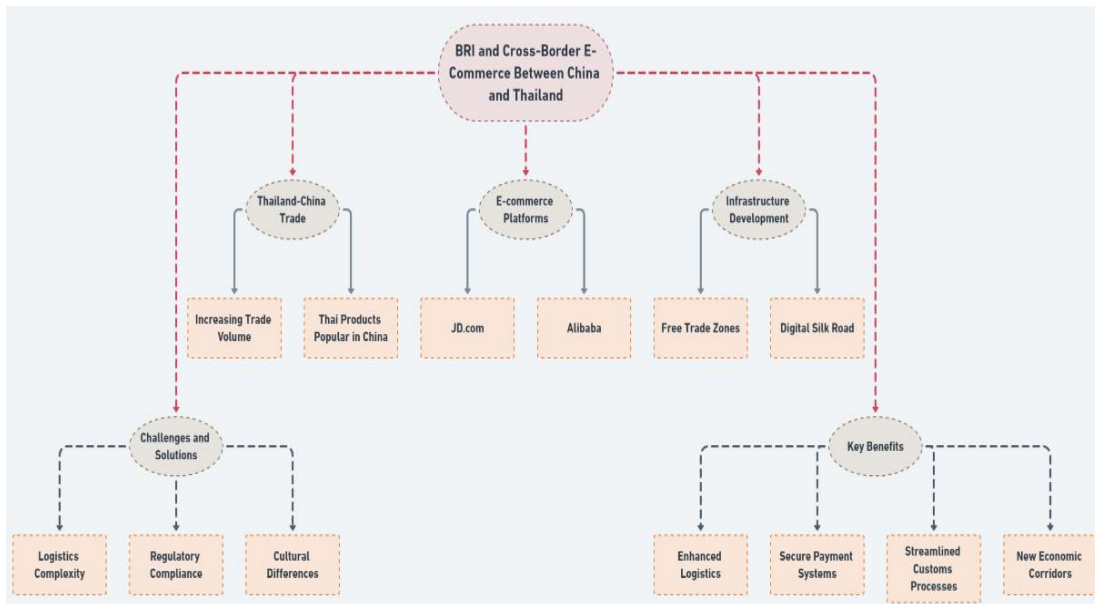


Figure 1.6 Expansion of cross-border E-commerce between China and Thailand (Majcherczyk & Shuqiang, 2019)

1.1.6 Growth of Muslim Population in China: A Motivation for Halal Food Trade in Chinese Market

Islam, a major and widespread religion, dominates regions at the core of the Land and Maritime Silk Roads, including the Middle East, Central Asia, South Asia, and Southeast Asia. Therefore, maintaining strong relations with Islamic countries is crucial for the success of China's Belt and Road Initiative. China's 23 million Muslims, particularly the Hui people, who embody both Chinese and Islamic cultures, serve as a natural bridge for fostering cooperation, notably in Islamic finance and Halal food production. Expanding cultural exchanges between China and Islamic nations is essential to overcoming mutual misunderstandings and enhancing collaboration (Li, 2018). The Halal food sector is projected to reach a value of 1.38 trillion USD by 2024, with a 3.5% growth rate from 2019 to 2024, and the overall Islamic economy is expected to hit 2.4 trillion USD by 2024 (Masood & Rahim, 2021). The Belt and Road Initiative (BRI) not only drives the development of large-scale infrastructure projects but also boosts international trade and digital transformation, particularly benefiting the global Halal food market. This initiative aligns the interests of China's 1.44 billion population with the world's 1.9 billion Muslims, fostering significant growth in the Halal food sector.

1.1.7 Halal Food Consumption and Demand in Chinese Market

Food consumption is primarily shaped by religious beliefs and individual attitudes toward religious guidelines. While Christianity generally has fewer dietary restrictions, other religions, such as Judaism and Islam, prohibit pork, and Buddhism and Hinduism often forbid beef (NA & Sack, 2016). Muslims adhere to Islamic dietary laws, consuming only Halal food as prescribed in the Qur'an. Halal, meaning acceptable and lawful, encompasses qualities such as cleanliness, protection, preparation, packaging, and decontamination, collectively referred to as "Tayyab," signifying purity, nourishment, and safety. The growing Muslim population, whether by birth or conversion, represents an increasingly significant market due to their unwavering commitment to Halal consumption, irrespective of their geographic location. This demographic is gaining economic influence and shows a rising trend in modern food consumption while maintaining religious values. The global Halal food market, valued at \$715 billion in 2018, is projected to grow at a rate of 12.7% annually until 2027, reflecting rapid and sustainable growth driven by the world's second-largest religion, Islam (Ali et al., 2017; Archibald, 2007; Insights, 2019; Kamaruddin & Jusoff, 2009; Qaraḍāwī, 1984). In Southeast Asia, countries like Malaysia, where Muslims make up about 65% of the population, are increasingly focusing on producing Halal foods and products. This trend extends to nations with smaller Muslim populations, such as Singapore and Thailand, driven by the rising demand from Muslim consumers and importers for Halal-certified products. Even in countries where Muslims are a minority, such as Thailand, Korea, and Japan, Halal consumption is becoming a new trend. This shift aims to ensure food compliance with Muslim dietary laws while also creating economic opportunities for the Muslim community (Abu-Hussin et al., 2017; Wilson, 2014; Wilson et al., 2013).

According to China's constitution, it is a unitary multinational state with the Han majority and 55 minority ethnic groups, including 113 million people. Hui Muslims in China, part of these minorities, have faced two centuries of regulation and challenges due to government policies and globalization (Gladney, 2003; Guo et al., 2011). In China, Muslims, though only 1.8% of the population, form a significant minority among other diverse groups like polytheists, secularists, and heathens (Live China Population Clock, 2019). Despite being a small percentage, their numbers are considerable compared to many Muslim-majority countries. China's robust economy attracts international business

and students, contributing to the growth of the Muslim community and the Halal food sector (HFC). There is a notable correlation between consumer religion, moral attitudes, habits, and intentional behaviors (Delener, 1994). Food-purchasing choices and consumption habits are significantly influenced by religion in many countries, with religiosity driving the intent to choose Halal food among various ethnic communities. As global demand for Halal food rises, countries have a growing opportunity to gain a competitive advantage in the international market (Dindyal & Dindyal, 2003; Mukhtar & Butt, 2012; Swanson, 1996; Zakaria & Abdul-Talib, 2010).

China's Halal food market has experienced substantial growth, driven by the country's sizable Muslim population and the rising demand for high-quality Halal products. This growth is further supported by the Belt and Road Initiative (BRI), which fosters trade and cultural exchanges between China and primarily Muslim nations. The BRI streamlines the integration of Halal food supply chains, boosting the import and export of Halal-certified products. As a result, this initiative not only increases the availability and diversity of Halal food in China but also positions the country as a significant player in the global Halal food market (Brose, 2018). The Halal industry has shown resilience during the COVID-19 pandemic, continuing to offer growth opportunities. This period serves as a pivotal benchmark for advancing the Halal industry and lifestyle, benefiting the Muslim community and participating countries (Hidayat et al., 2022; Rafiki et al., 2021).

Halal food markets along the Belt and Road Initiative (BRI) route represent significant growth potential, linking Islamic countries in Central, South, and Southeast Asia. The BRI facilitates logistical and digital connections between China and Thailand, enhancing trade routes by land, sea, and digital means. By 2030, key Muslim markets in Asia, including Pakistan, Indonesia, Bangladesh, Iran, and Malaysia (Mao & Dawod, 2022), are projected to encompass populations totaling at least 1 billion. To achieve Thailand's goal of penetrating the new Halal market, leveraging Chinese e-commerce platforms will be essential for connecting Thai Halal products with Chinese Muslims and other Muslim markets. This research will focus on enhancing the trade knowledge of Thai Halal food producers and exporters to capitalize on the emerging opportunities within the BRI framework (Awuson-David et al., 2021; Hakim et al., 2020). Our study focuses on

the primary global growth market, beginning with China's Belt and Road Initiative, which facilitates new digital e-commerce and logistics connections with Islamic countries. Additionally, the expanding global Islamic economy, spearheaded by the Halal food sector, is driving demand among Chinese Muslims and Muslims residing in China. The study's findings reveal robust consumption of diverse Halal food products, harmonizing with key festive seasons in both Chinese culture and Islamic rituals. These insights will enable Thai Halal food producers and exporters to anticipate future Halal food demands, particularly through data-driven predictions on e-commerce platforms, before entering the Chinese market.

1.2 Thailand's Halal Market.

The acceptance of Halal food in non-Muslim countries is growing, driven by perceptions of it being fresh, natural, and safe (Wilkins et al., 2019). This aligns with global trends toward healthy and ethical consumption, making Halal food a strategic tool for cultural diplomacy (Lipka & Hackett, 2017). Countries like South Korea and Thailand are also leveraging Halal food to enhance their cultural diplomacy and economic growth. However, challenges such as social resistance and inefficiency in the Halal support system remain. Overall, the promotion of Halal food can significantly enhance the economic and social influence of countries by bridging cultural divides and promoting mutual understanding through shared values of quality and ethical consumption (Park & Jamaludin, 2018) (Lubis et al., 2022).

Since 2019, Thailand has emerged as a major player in the Halal market, becoming the 11th largest global exporter with significant growth driven by standardization efforts. As the leading producer in Southeast Asia, Halal food exports accounted for 20% of Thailand's total exports, increasing by 19% over five years. Tourism further enhances its appeal to Muslim visitors (Insights, 2019; Jeaheng et al., 2019). Thailand has actively promoted its culture through initiatives like the "Thai Kitchen to the World" project, "Thai Select," and global Thai festivals, showcasing local wisdom, goods, and services in diverse formats (Cogan, 2024; Jones & Theerawong, 2021; Praditsilp & Pongsakornrungsilp, 2024). Thai food enjoys global popularity, with dishes like Massaman, Tom Yum Goong, and Papaya Salad consistently ranked among CNN Travel's 50 best foods. This widespread appeal is partly due to the thriving Thai communities abroad, making dishes like Pad Thai and Tom Kha Gai internationally beloved (Suanpang

et al., 2023). During 2022, Thailand had a large net trade with China in the exports of Plastics and rubber (\$8.34B), Vegetable Products (\$8.04B), and Machines (\$7.38B). During 2017, China had a large net trade with Thailand in the exports of Machines (\$30B), Metals (\$11.2B), and Chemical Products (\$7.02B). Statistics show that, from January to November 2023, Thailand exported Halal food products worth about 217 billion baht, representing a growth rate of 2.6 percent over the same period of the previous year. There are currently more than 15,000 Halal food producers in Thailand, with more than 3,500 restaurants (Wanli, 2024).

Mahamud and Yama (2020) explored the impact of Halal orientation strategies (HOS) on the financial performance (FP) of Halal food companies (HFC) in Thailand, emphasizing the role of Halal culture (HC) as a moderating factor. The findings indicate that while Halal production negatively impacts FP, Halal transformation, storage, and materials positively influence it (Mahamud & Yama, 2020). HC enhances the positive effects of these strategies by promoting a unified organizational commitment to Halal principles. This not only boosts financial outcomes but also highlights the soft power of Halal food as a faith-driven market force, enhancing appeal and trust among consumers globally.

Halal practices in Thailand's tourism sector are crucial for sustainable tourism and economic development. The Tourism Authority of Thailand (TAT) supports Halal tourism through initiatives like mobile apps and promotional activities, enhancing the country's reputation as a Muslim-friendly destination (Hossain & Omar, 2020). Halal certification ensures satisfaction for Muslim tourists, contributing to business sustainability. Halal food serves as soft power, connecting the global Muslim community. Developing countries must improve certification systems, infrastructure, and awareness to capitalize on the Halal market. Thailand's strong Halal market and tourism sector demonstrate the economic and cultural benefits of promoting Halal food, showcasing the importance of certification, infrastructure, and awareness. Overall, leveraging Halal food can enhance a country's global influence and economic performance by connecting diverse populations through shared values of quality and ethical consumption.

1.3 Marketing Strategies for Halal Food Trade

Several traditional marketing approaches have been studied and tested through prototype models, so far Philip Kotler's 5.0 marketing strategy has stood out of the crowd. The application of Philip Kotler's Marketing 5.0 (Figure 1.7) strategy in the Halal food trade focuses on integrating advanced technologies and human-centric approaches to enhance customer engagement and satisfaction (Martini & Rustiadi, 2024). Marketing 5.0 involves utilizing big data, artificial intelligence, and augmented reality to personalize customer experiences and streamline the customer journey through a Data-Driven marketing approach.

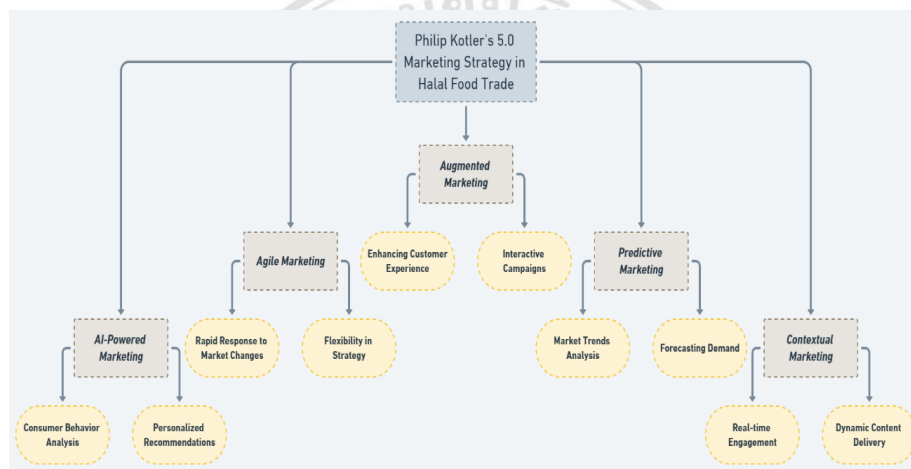


Figure 1.7 Halal food trade by applying Phillip Kotler's 5.0 to develop a marketing strategy to acquire potential customers in Indonesia (Martini & Rustiadi, 2024)

In the Halal food trade, this approach enhances brand trust and loyalty by ensuring transparent communication and emphasizing the ethical and health benefits of Halal products. The strategy's emphasis on social media, online reviews, and influencer endorsements has proven effective in appealing to younger demographics. The results indicate that Halal food companies adopting Marketing 5.0 can significantly boost market presence and consumer confidence by aligning modern technological tools with the values and expectations of their target audiences, thereby fostering sustained growth and competitive advantage.

1.4 Problem of Statements

The trade of Halal food products between Thailand and China presents significant potential given the rising demand for Halal-certified goods globally. However, this promising market faces substantial challenges that hinder its optimal growth and

efficiency. Traditional marketing strategies, which have been employed extensively, are increasingly proving inadequate in addressing the unique complexities associated with this bilateral trade. Key issues include fluctuating consumer demand, cultural differences, and the dynamic nature of e-commerce platforms. This detailed problem statement delves into these challenges and emphasizes the need for a robust, data-driven approach to enhance the trade of Halal food products between Thailand and China.

1.4.1 Fluctuating Consumer Demand

The demand for Halal food products is highly volatile and influenced by various factors, including socio-economic conditions, religious observances, and seasonal trends (Jia & Chaozhi, 2021). In the context of Thailand and China, understanding and predicting these fluctuations is crucial for maintaining a steady supply chain and ensuring customer satisfaction. Traditional forecasting methods often fail to capture the nuances of consumer behavior, leading to either surplus inventory or stockouts, both of which incur significant costs and negatively impact consumer trust (Ruangsriroj & Suvittawat, 2022).

1.4.2 Cultural Differences

Cultural nuances play a pivotal role in consumer preferences and purchasing behaviors. The Halal food market is deeply intertwined with religious beliefs and practices, which vary widely between Thailand and China. Thai producers need to adapt their products and marketing strategies to align with the cultural expectations of Chinese Muslim consumers (Sai & Fischer, 2015). Misalignment in cultural understanding can lead to products that are either unsuitable or unappealing to the target market, resulting in missed opportunities and wasted resources (Arsil et al., 2018).

1.4.3 Dynamic Nature of E-Commerce Platforms

E-commerce has revolutionized the way Halal food products are traded, providing an expansive and efficient marketplace. However, the rapid evolution of e-commerce platforms presents its own set of challenges (Wang, 2023). These platforms are characterized by high competition, fast-paced technological advancements, and varying regulatory standards. Traditional marketing approaches often fail to keep up with the agility required in the digital marketplace, leading to inefficiencies and the inability to fully capitalize on market opportunities (Ismail & Masud, 2020).

1.4.4 Need for a Data-Driven Approach

To address these challenges, there is a pressing need for a comprehensive, data-driven approach that leverages advanced analytics to predict consumer demand and provide contextual insights. This approach should be designed to inform agile marketing strategies that can dynamically adjust to market conditions and consumer preferences. The following sections detail the components and benefits of such an approach:

1.4.5 Predictive Analytics

Utilizing predictive analytics involves harnessing data from various sources, including e-commerce transactions, social media trends, and historical sales data. Machine learning models, specially SWOT and ICT strategy can analyze this data to forecast future demand with greater accuracy (Bohari et al., 2013). This predictive capability enables businesses to optimize inventory levels, reduce waste, and improve customer satisfaction by ensuring that the right products are available at the right time. By accurately predicting consumer demand and understanding cultural preferences, businesses can ensure that their products meet the expectations of their target market (Syukur & Nimsai, 2018). This leads to higher consumer satisfaction, repeat purchases, and positive word-of-mouth, which are critical for long-term success.

1.4.6 Contextual Analysis

Contextual analysis involves examining the broader socio-economic and cultural factors that influence consumer behavior. By understanding the specific contexts within which consumers make purchasing decisions, businesses can tailor their marketing strategies to better meet the needs of their target audience (Al-Ansi et al., 2023; Chen et al., 2024). This includes analyzing consumer sentiment, cultural trends, and economic indicators that may impact purchasing power and preferences. A data-driven approach streamlines operations by optimizing inventory management, reducing waste, and improving supply chain efficiency. This not only lowers operational costs but also enhances the overall competitiveness of businesses in the Halal food market (Mehraliyev et al., 2022).

The core problem addressed in this study is the lack of an effective, data-driven framework for predicting consumer demand and conducting contextual analysis to support agile marketing for Halal food products traded between Thailand and China on e-commerce platforms. The existing methodologies do not adequately leverage the vast amounts of available data to provide actionable insights that can adapt to the rapidly changing market conditions and consumer preferences.

1.5 Research Questions

- a) How can consumer demand for Halal food products be accurately predicted using data-driven methods?
- b) What contextual factors influence the demand for Halal food products in the e-commerce trade between Thailand and China?
- c) How can agile marketing strategies be developed and optimized based on demand predictions and contextual analysis?
- d) What are the key challenges and opportunities in the Halal food trade between Thailand and China via e-commerce platforms?

1.6 Objectives of The Study

The primary objective of this study is to develop a comprehensive, data-driven framework for predicting consumer demand and conducting contextual analysis to enhance agile marketing strategies for the Halal food trade between Thailand and China via e-commerce platforms. Specific objectives include:

- 1) Identifying and analyzing key data sources relevant to consumer demand for Halal food products.
- 2) Developing predictive models to forecast consumer demand accurately.
- 3) Conducting contextual analysis to understand the factors influencing consumer behavior.
- 4) Proposing and validating agile marketing strategies informed by predictive and contextual insights.

1.7 Main Contributions of the Research

This research contributes to both academic and practical domains by:

- i) Providing a novel, data-driven framework for demand prediction and contextual analysis in the Halal food sector.
- ii) Enhancing understanding of consumer behavior and preferences in the e-commerce context between Thailand and China.
- iii) Offering actionable insights and strategies for businesses to improve their marketing agility and effectiveness.
- iv) Addressing a significant gap in the literature concerning Halal food trade and e-commerce integration.

1.8 Research Scope

The scope of this research encompasses:

- i) The Halal food trade between Thailand and China, focusing on products traded via e-commerce platforms.
- ii) Data-driven approaches to predict consumer demand, including the use of machine learning and statistical models.
- iii) Contextual analysis of market and cultural factors influencing demand.
- iv) Development and assessment of agile marketing strategies based on predictive and contextual insights.

1.9 Conceptual Framework

The conceptual framework of this study integrates several components (Figure 1.8):

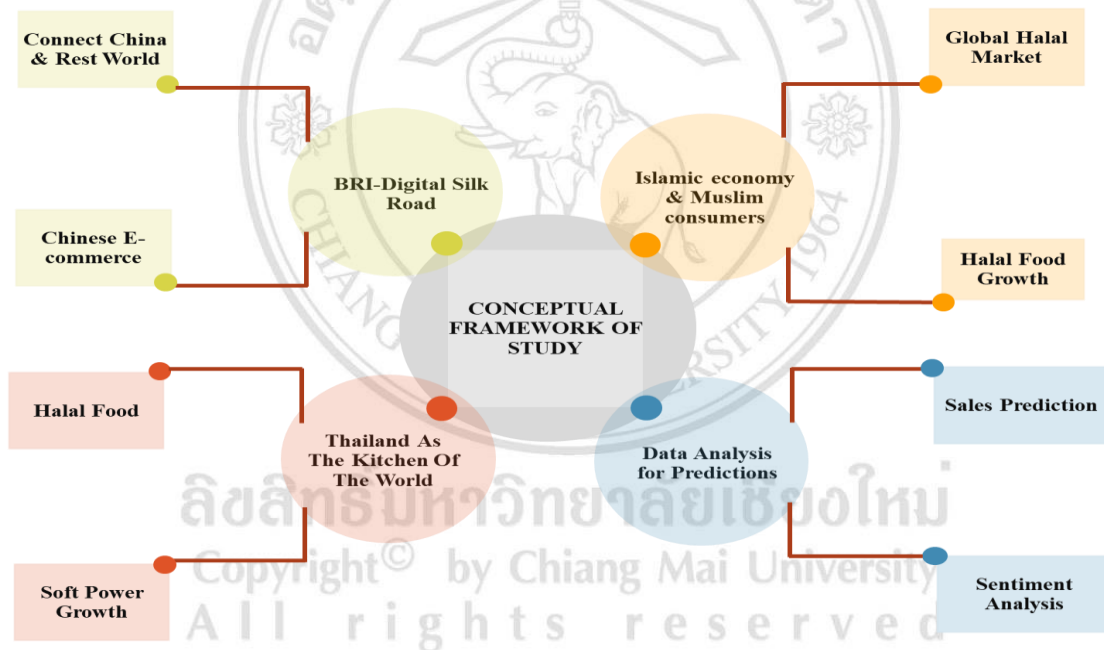


Figure 1.8 Conceptual Framework of This Dissertation

- I. Belt and Road Initiative (BRI) - Digital Silk Road
Focuses on connecting China with the rest of the world through digital infrastructure, enhancing Chinese e-commerce, and promoting the global expansion of the Halal food market.
- II. Thailand's Role as the "Kitchen of the World"

Highlights Thailand's position as a leading producer of Halal food, contributing to the soft power growth and the country's influence in the global Halal market.

III. Islamic Economy and Muslim Consumers

Examines the global Halal market and the increasing demand for Halal-certified products among Muslim consumers, driving the growth of the Halal food industry.

IV. Data-driven analysis for Predictions

Utilizes data analysis, including sales prediction and sentiment analysis, to enhance marketing strategies and better understand consumer behavior in the Halal food trade.

1.10 Thesis Outline

The thesis is structured as follows:

- (i) Chapter 1: Introduction – Provides an overview of the research background, problem statement, objectives, and contributions.
- (ii) Chapter 2: Literature Review – Reviews existing research related to Halal food trade, consumer demand prediction, and agile marketing.
- (iii) Chapter 3: Research Methodology – Describes the research design, data collection methods, and analytical techniques used.
- (iv) Chapter 4: Data Analysis and Findings – Presents the results of the demand prediction models and contextual analysis.
- (v) Chapter 5: Discussion – Interprets the findings and discusses their implications for marketing strategies and trade enhancement.
- (vi) Chapter 6: Conclusion and Recommendations – Summarizes the research contributions, limitations, and provides recommendations for future research and practice.
- (vii) Chapter 7: Future work – Summarize and recommend the solutions to cope with the F2C business models which are rapidly spreading all over the world specifically TEMU from China

CHAPTER 2

LITERATURE REVIEW

This Chapter of the thesis provides an in-depth literature review focusing on the rapidly growing Halal food market and the critical role of marketing strategies in capitalizing on this expansion. The chapter examines traditional and contemporary marketing approaches, highlighting the shift towards data-driven strategies enabled by advanced technologies such as AI, machine learning, and web scraping. It underscores the importance of Philip Kotler's Marketing 5.0 model and the Segmentation, Targeting, and Positioning (STP) framework in enhancing market analysis and consumer engagement. The review also discusses the integration of agile marketing strategies to maintain competitiveness in the dynamic e-commerce environment, particularly in the context of the Halal food trade between Thailand and China.

2.1 Marketing Strategies in the Halal Food Trade

The Halal food market is a rapidly growing sector driven by the increasing Muslim population and rising demand for Halal-certified products. Effective marketing strategies are crucial for businesses to capitalize on this expanding market. This review explores contemporary marketing strategies in the Halal food trade, emphasizing the integration of Philip Kotler's Marketing 5.0 model and the Segmentation, Targeting, and Positioning (STP) framework, enhanced by data-driven technologies such as web crawling and web scraping.

2.1.1 Traditional and Contemporary Approaches

Traditional marketing strategies in the Halal food market have focused on emphasizing Halal certification, highlighting religious compliance, and targeting Muslim consumers through community-specific channels. These strategies have been effective in establishing brand trust and loyalty among Muslim consumers. However, the dynamic nature of the market and the rise of digital commerce have necessitated the adoption of more sophisticated, data-driven approaches (Yang, 2019). Contemporary marketing

strategies leverage digital platforms to reach a broader audience. These strategies include the use of social media marketing, influencer partnerships, content marketing, and personalized advertising (Figure 2.1). Digital platforms enable businesses to engage directly with consumers, gather feedback, and adapt their offerings in real-time to meet consumer preferences (Janah & Adinugraha, 2022).

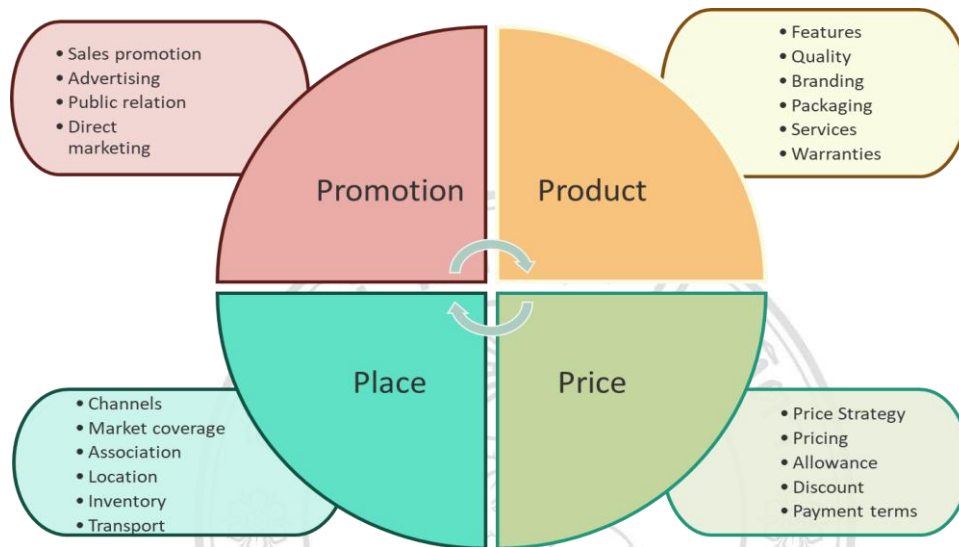


Figure 2.1 4P Marketing mix of conventional marketing approach (Dadzie et al., 2017)

(Paesai, 2014) discussed the integration of Philip Kotler's Marketing 5.0 strategy and the STP (Segmentation, Targeting, Positioning) framework in the context of the Halal food trade. The findings reveal that leveraging advanced technologies, like AI and big data, can enhance market analysis and customer insights, thereby driving sales and predicting market trends effectively. This approach aligns with Kotler's 5.0 strategy by emphasizing customer-centric marketing and technological integration. The study underscores the importance of creating personalized marketing campaigns and developing a strong brand presence to meet consumer demands and expand market reach. Specifically, the application of these strategies can significantly boost the Halal food trade from Thailand to China by tailoring products to specific consumer segments, enhancing product quality, and establishing robust distribution networks. The predictive analysis enabled by these strategies ensures sustainable strategic planning, aiding in capturing a larger market share and fostering long-term growth in the global Halal food market.

2.1.2 Importance of Philip Kotler's Marketing 5.0 Model

This study will centre on optimizing Philip Kotler's data-driven Marketing 5.0 as a foundational element, with additional methodologies considered for future research (Figure 2.2) (Adinugraha et al., 2021). The primary focus of Marketing 5.0, emphasized here, is leveraging data throughout the marketing process, from research and strategic planning to online execution. Concurrently, the study will examine not only transactions on China's e-commerce platforms but also the broader Chinese market and global Muslim consumers in the future.

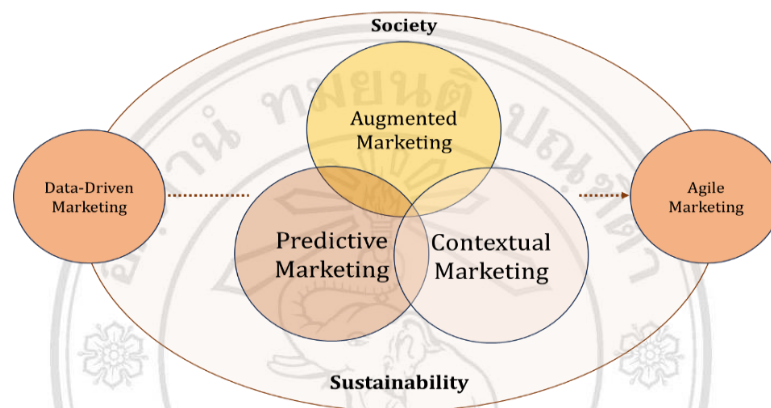


Figure 2.2 The 5 Components of Marketing 5.0 by Phillip Kotler. (Adinugraha et al., 2021)

Philip Kotler's Marketing 5.0 model, which also focuses on leveraging advanced technology and data analytics to enhance marketing efforts, is highly relevant in the Halal food trade. Marketing 5.0 emphasizes five core components in the sense of contextual analysis: data-driven marketing, predictive analytics, personalized consumer experiences, AI and machine learning, and advanced digital tools (Basalamah et al., 2023).

- i) **Data-Driven Marketing:** Utilizes vast amounts of data to make informed marketing decisions. This includes understanding consumer behavior, preferences, and purchasing patterns.
- ii) **Predictive Analytics:** Involves forecasting future market trends and consumer demands using machine learning algorithms. This helps businesses anticipate changes and adapt their strategies accordingly.
- iii) **Personalized Consumer Experiences:** Focuses on creating tailored marketing messages and product offerings based on individual consumer profiles, enhancing customer satisfaction and loyalty.

- iv) **AI and Machine Learning:** These technologies analyze data to identify patterns and trends, automate marketing processes, and optimize campaign performance.
- v) **Advanced Digital Tools:** Encompasses tools like web crawling and web scraping to gather data from various online sources, providing insights into consumer behavior and market trends.

Data-driven marketing tools provide insights into consumer behavior and trends for informed decision-making, while modern approaches like content marketing, influencer collaborations, and personalized experiences enhance engagement and brand advocacy through e-commerce and social networking. (Rünzel et al., 2021; Sha et al., 2021; Xu et al., 2018).

2.1.3 Integration of STP Marketing Strategy

The Segmentation, Targeting, and Positioning (STP) marketing strategy is crucial for effectively reaching and engaging with different consumer segments in the Halal food market. When integrated with Kotler's Marketing 5.0 model, the STP framework becomes even more powerful. Strategies for marketing are critical to business success, especially in today's competitive e-commerce market. Companies in the Halal food market in China can improve their segmentation, targeting, and positioning strategies by adopting concepts from Phillip Kotler's Marketing 5.0 and the conventional STP model (Figure 2.3). These frameworks offer a structured method for studying consumer behavior, market dynamics, and competitive positioning.



Figure 2.3 The STP model for the marketing plan.

Segmentation: Divides the broader market into distinct consumer groups based on various criteria such as demographics, psychographics, and behavior. In the Halal food market, segmentation can include factors like religious adherence, dietary preferences, and cultural practices.

Targeting: Involves selecting the most attractive segments to focus marketing efforts on. Data-driven technologies enable precise targeting by identifying the segments with the highest potential for growth and profitability.

Positioning: Refers to the process of developing a unique value proposition and marketing message that resonates with the targeted segments. Personalized marketing messages and product offerings can be created using insights gained from data analytics.

Segmentation categorizes the Chinese Halal food market by factors like religious affiliation and shopping behavior, while targeting selects the most appealing segments to optimize resource allocation, market share, and sales potential. (Camilleri, 2020). Understanding Muslim consumers' specific demands, like the importance of the "Halal Logo," allows businesses to gain credibility and appeal by marketing their products as Halal-certified and trustworthy. (Ahmad et al., 2019).

Overall, the combination of marketing strategies, data-driven technologies, and strategic positioning will greatly help Halal food enterprises in China's e-commerce sector. Businesses that understand customer requirements, target the proper segments and successfully position their products can gain a competitive advantage and drive growth in this dynamic and growing market.

2.1.4 Agile Marketing Strategy

Agile marketing strategies prioritize flexibility and responsiveness, allowing businesses to quickly adapt to changing market conditions. Data-driven insights from predictive analytics and contextual analysis inform these strategies, enabling businesses to deploy targeted marketing campaigns, adjust pricing, and develop new product offerings that resonate with consumers. Agile marketing is crucial in the dynamic e-commerce environment, where high competition and rapid technological advancements necessitate staying ahead of market trends (Nicoletti & Nicoletti, 2021).

Contextual analysis examines broader socio-economic and cultural factors influencing consumer behavior. By understanding the specific contexts within which consumers make purchasing decisions, businesses can tailor their marketing strategies to better meet the needs of their target audience (Krentzel, 2020). This includes analyzing consumer sentiment, cultural trends, and economic indicators that may impact purchasing power and preferences.

Agile marketing strategies are essential for staying competitive in the fast-paced e-commerce environment. These strategies prioritize flexibility and responsiveness, allowing businesses to quickly adapt to changing market conditions. Data-driven insights from predictive analytics and contextual analysis can inform these strategies, enabling businesses to deploy targeted marketing campaigns, adjust pricing, and develop new product offerings that resonate with consumers (Hamid Yaseen, 2021). Businesses that leverage data-driven insights to inform their marketing strategies can differentiate themselves from competitors. By offering products that are specifically tailored to the needs and preferences of their consumers, they can establish a strong market presence and build brand loyalty. Access to accurate and timely data enables businesses to make informed decisions. This includes identifying emerging market trends, assessing the impact of marketing campaigns, and making strategic adjustments to maintain a competitive edge.

The integration of agile marketing strategies with data-driven approaches enhances business operations by optimizing inventory management, reducing waste, and improving supply chain efficiency. This not only lowers operational costs but also increases the overall competitiveness of businesses in the Halal food market.

2.1.5 Data-Driven Technologies: Web Crawling and Web Scraping

Currently, web crawling and web scraping have widely been used to collect and store big datasets on their own servers from a specific website, URL, or page required for different purposes. Many researchers and marketers have gone into this digital technology to get specific information on e-commerce sites such as URLs, content, product information, price, picture, and a clip-on specific page from specific portal sites. Keeping the data could aid in the development of a "big data tank" for further analysis and prediction based on various factors. This means that the techniques are widely accepted for use in high-speed and data-management contexts. Web crawling and web scraping are critical technologies in the implementation of data-driven marketing strategies. These technologies enable the collection of vast amounts of data from online sources, providing valuable insights into consumer behavior and market trends (Song et al., 2022).

- i) **Web Crawling:** Involves systematically browsing the internet to index and collect data from websites. This data can include consumer reviews, social media posts, and product descriptions, which are useful for understanding consumer preferences and sentiments.

- ii) **Web Scraping:** Extracts specific data from websites and stores it in a structured format for analysis. This data can be used to monitor competitor strategies, track market trends, and gather consumer insights.

2.1.6 Application of Data-Driven Tech Marketing

The application of these integrated strategies in the Halal food market can be illustrated through several practical examples (McElhinney, 2024):

- a) **Consumer Insights:** By using web scraping to collect consumer reviews and social media posts, businesses can analyze sentiments and identify key trends in consumer preferences. This data can be used to refine product offerings and marketing messages.
- b) **Competitive Analysis:** Web crawling can be employed to monitor competitor websites and social media activity. This helps businesses stay informed about competitor strategies and market positioning, allowing them to adapt their own strategies to maintain a competitive edge.
- c) **Personalized Marketing:** Data collected through web crawling and web scraping can be used to create detailed consumer profiles. These profiles enable businesses to deliver personalized marketing messages and offers, enhancing consumer engagement and loyalty.
- d) **Predictive Analytics:** By analyzing historical sales data and online consumer behavior, businesses can forecast future demand and adjust their inventory and marketing strategies accordingly. This helps in optimizing supply chain management and reducing waste.
- e) **Real-Time Adaptation:** Data-driven technologies allow businesses to monitor real-time market trends and consumer feedback. This enables quick adjustments to marketing campaigns and product offerings, ensuring they remain relevant and effective.

The integration of Philip Kotler's Marketing 5.0 model with the STP marketing strategy, supported by data-driven technologies such as web crawling and web scraping, offers a powerful approach to marketing in the Halal food trade. These strategies enable businesses to gain deep insights into consumer behavior, effectively target and engage with different market segments, and adapt quickly to changing market conditions. As the Halal food market continues to grow, the adoption of these advanced marketing

strategies will be crucial for businesses seeking to achieve sustainable growth and competitive advantage. The literature highlights the critical role of data-driven consumer demand prediction and agile marketing strategies in enhancing the Halal food trade. Thailand's success in the Halal market, driven by standardization and cost-effective production, underscores the importance of leveraging local strengths and government support. Predictive analytics and machine learning models provide the necessary tools to forecast consumer demand accurately, while agile marketing strategies ensure businesses remain competitive in the dynamic e-commerce environment. These approaches collectively contribute to the sustainable growth and global expansion of the Halal food industry as a new soft power of Thailand.

2.1.7 Market Potential to Export Thai Halal Food

According to “Think Halal Think Thailand”

(www.ammaman.thaiembassy.org) Thailand is a prominent exporter of Halal products, generating approximately USD 6 billion annually and ranking 10th globally in Halal food exports. Strategic initiatives by the Thai government aim to enhance the country's position as a top Halal exporter through strengthening certification bodies, expanding markets, and bolstering consumer confidence both domestically and internationally. Thailand's central location in Southeast Asia provides a key geographical advantage, facilitating access to prosperous regions. Major Halal export products include food items, textiles, garments, cosmetics, and medical wellness services. Significant trade events such as the Thailand Halal Assembly and THAIFEX - World of Food Asia support the growth and visibility of Thailand's Halal industry.

Thai government by the public relations department announced that the government's vision “Ignite Thailand” By 2027 Thailand will become an ASEAN Halal which contains 4 years from 2024 to 2027. By the action plan, the GDP will be increased by 1.2 percent from the industrial sector and create about 100,000 jobs each year (www.thailand.prd.go.th). Halal food exports, comprising 20% of Thailand's total exports, have grown 19% over five years, driven by standardization efforts from organizations like CICOT and HSC. A uniform national Halal definition is crucial for market expansion, particularly towards China, and tourism, contributing 31.7% to GDP, further boosts Thailand's appeal to Muslim visitors from neighboring and distant

countries. (Insights, 2019; Jeaheng et al., 2019). Hence, a significant contribution, concerning its global growth, yet a valuable potential is unexplored.

www.ChinaDaily.com.cn declared that Thailand aims to become Southeast Asia's leading Halal hub by 2028, enhancing its global promotion of Thai food and products and boosting tourism. The government has approved initiatives, including establishing a national Halal industry committee and a Thai Halal industry centre, as announced by Prime Minister Srettha Thavisin. Discussions are underway with Brunei and Malaysia to develop a Halal food center, expected to increase Thailand's GDP by 1.2 percent, or 55 billion baht (\$1.53 billion). The global Halal industry, valued at \$2.4 trillion last year, is projected to grow to \$2.8 trillion by 2025, with Thailand ranking third in Asia for Halal food exports. In 2023, Thailand's Halal food exports reached 217 billion baht, a 2.6 percent increase year-on-year, with over 15,000 producers and 3,500 establishments focusing on products like rice, grains, and sugar cane.

According to Department of International Trade Promotion Ministry of Commerce (DITP), Thailand is a leading producer and exporter of Halal products, with a market valued at approximately USD 1.2 trillion globally. Key Halal exports include chicken, prawns, canned tuna, rice, fresh and dried fruits, vegetables, snacks, frozen food, ready-to-eat meals, cosmetics, and fashion products. The country has around 64,000 companies with Halal certification, and more than 160,000 products certified by the Central Islamic Council of Thailand (CICOT). In 2022, the total value of Halal food exports was approximately USD 5,927 million. Thailand's strategic location in Southeast Asia, surrounded by a sizable Muslim population, provides a comparative advantage in logistics and product range. The growing Muslim market in ASEAN, coupled with Thailand's high standards and modern certification processes, bolsters its potential as a significant Halal hub.

According to “The Halal Times” Thailand's Halal industry faces the challenge of bolstering consumer confidence in its products, still its Halal products are ready to surge to provide Thailand a global recognition as a Halal Hub. To address this, the Central Islamic Council of Thailand (CICOT), supported by the Halal Standard Institute of Thailand (HSIT), promotes international Halal standards and certification procedures. HSIT uses the principle of "Religious confirmation and scientific support" to maintain high standards. Over 160,000 products, 33,000 brands, and 14,000 companies in Thailand

have received Halal certification, making it the country with the highest number of Halal-certified products globally. The global Halal market is worth over USD 2 trillion and is expected to reach USD 3 trillion by 2026, driven by a growing Muslim population and increased awareness among non-Muslims. Major Thai brands like Tao Kae Noi and conglomerates such as CP Group and Betagro are investing in Halal production. Additionally, Thailand's Halal industry includes cosmetics, fashion, pharmaceuticals, and tourism, with the country ranked among the top five non-Muslim travel destinations in the 2022 Global Muslim Travel Index. Thailand is enhancing its Halal market presence by presenting products at THAIFEX, a major food and beverage event.

2.2 Cross Boarder E-commerce Between Thailand and China

(Ractham et al., 2019) examined the Cross Border E-Commerce (CBEC) model between Thailand and China, highlighting the importance of two-sided e-market platforms that link international sellers with local buyers. The study focuses on Thai products like durian and cosmetics, which are popular in the Chinese market. It emphasizes the need for government support, supply chain coordination, online platform design, and effective marketing strategies to ensure successful CBEC. The study finds that a well-coordinated platform can enhance product information, pricing, and logistics, benefiting both sellers and buyers. Currently, Thailand lacks a comprehensive online platform, which creates challenges in integrating suppliers and meeting demand. The Chinese government supports CBEC through pilot zones and bonded warehouses, facilitating efficient product distribution. Overall, the study suggests that developing a robust two-sided e-market platform can significantly improve CBEC activities and reduce grey market transactions.

(Yang, 2022) did a detailed case study on cross-border e-commerce between China and Thailand explores the sustainable development facilitated by the Belt and Road Initiative. It highlighted the policy and cooperation opportunities, challenges, and strategic countermeasures for enhancing e-commerce between the two nations. Key findings include the necessity for government support, supply chain coordination, and efficient online platform design. Thailand's e-commerce market, though still developing, shows significant potential due to its large internet user base and supportive logistics infrastructure. The study identifies major issues such as geopolitical risks and trade protectionism. Proposed models for sustainable development include self-operating B2C,

overseas warehouse storage, and user-sharing rebate systems. The results emphasize the need for a two-sided e-market platform to optimize transactions and promote economic integration under the Belt and Road framework.

(She et al., 2020) explored the development of the B2B2C (Business to Business to Consumer) e-commerce model between Thailand and China, highlighting the role of digital technologies in enhancing cross-border commerce. Key findings include the identification of strategic advantages provided by China's Guangxi and Sichuan Free Trade Pilot Zones and the ASEAN framework. The use of WeChat platforms, combined with advanced digital tools and localized content, aims to overcome language barriers, facilitate cross-border transfers, and improve post-sales services for Thai merchants. The study emphasizes the need for government support, supply chain coordination, effective online platform design, and robust marketing strategies to ensure successful B2B2C operations. Additionally, it discusses the necessity of addressing geopolitical risks and trade protectionism to maximize the potential of the cross-border e-commerce market. The comprehensive platform developed aims to enhance the overall efficiency of trade between the two countries, ultimately promoting economic integration and benefiting consumers by providing high-quality, affordable Thai products (Figure 2.4).

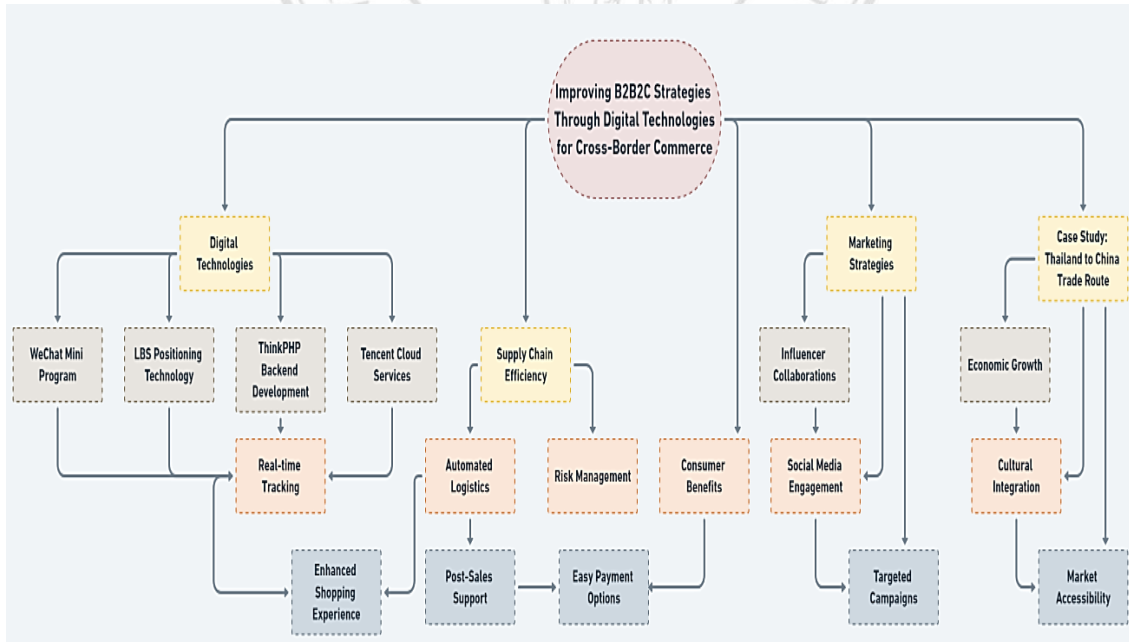


Figure 2.4 Improvement strategy for the B2B2C model between China and Thailand (She et al., 2020).

(Liu & Kongjit, 2024) reported the cultural factors influencing Chinese consumers' purchase of Thai products via cross-border e-commerce platforms, focusing on Thai latex pillows on Tmall Global. Utilizing grounded theory and Hofstede's cultural dimensions, the research highlights the importance of cultural values such as power distance, collectivism, uncertainty avoidance, femininity, and long-term orientation in shaping purchasing behavior. Results show that practical rationality, loyalty, frugal consumption, and authority influence significantly impact Chinese consumer decisions. Additionally, non-cultural factors like product aesthetics and service efficiency also play crucial roles. This comprehensive analysis underscores the necessity for e-commerce platforms to integrate both cultural and non-cultural elements to enhance market stability and consumer satisfaction in cross-border trade between Thailand and China (Figure 2.5).

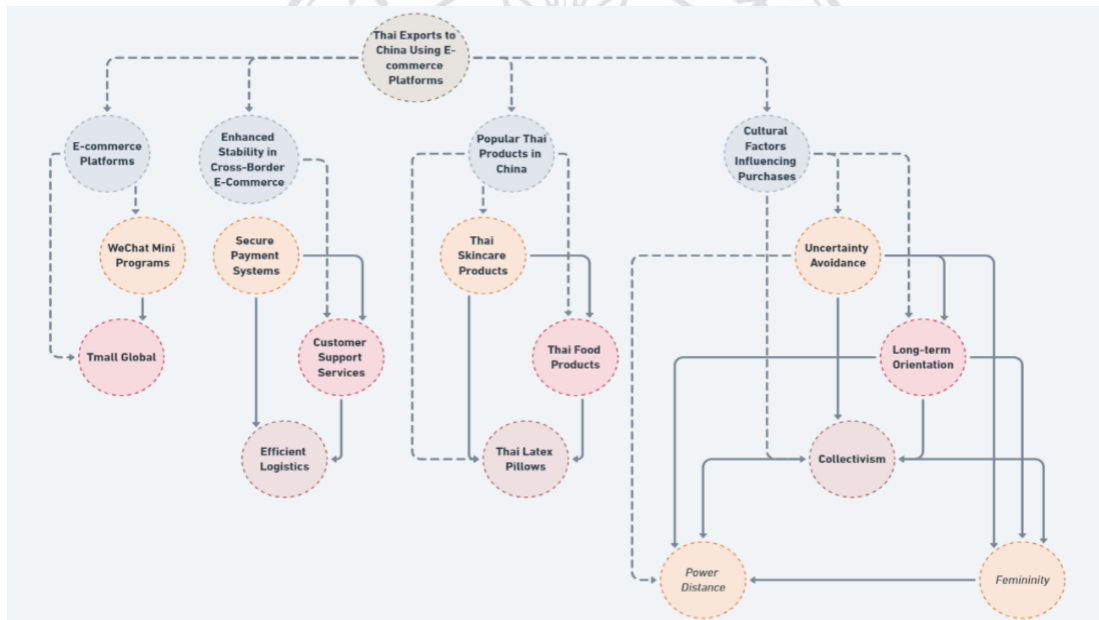


Figure 2.5 Exports from Thailand to China via E-commerce platforms (Liu & Kongjit, 2024)

Furthermore, to promote cross-border E-commerce in Thailand and China, there are many compensations provided by Chinese Government in this regard. (Changwei, 2022) discussed the opportunities in promoting cross-border e-commerce (CBEC) between China and ASEAN countries, particularly focusing on Thailand. It highlights the significant advantages brought by CBEC, such as the integration of advanced digital technologies and the expansion of comprehensive test areas. The Chinese government supports CBEC through tax compensations, foreign exchange settlements, and customs

clearance facilitation, which provide a stable policy environment for enterprises. Thailand benefits from these policies, enhancing its B2B e-commerce potential. The research identifies major challenges, including supply chain risk resistance and compliance with international standards. To overcome these, innovative countermeasures such as enhancing profitability sustainability, improving policy implementation, and fostering cooperation mechanisms are proposed. The development trends suggest great digital potential and new B2B opportunities, supported by China's strategic initiatives and policy reforms aimed at boosting CBEC growth and integration with ASEAN markets.

2.3 Targeted Market to enhance Exports from Thailand to China and World-wide.

The "State of the Global Islamic Economy Report 2023/24" highlights significant growth in the Halal economy, driven by a young and expanding global Muslim population. The Halal food sector, despite facing supply chain disruptions and geopolitical instability, saw Muslim spending increase by 9.6% in 2022, reaching \$1.4 trillion, and is projected to grow to \$1.89 trillion by 2027. The report emphasizes the importance of integrating sustainable strategic planning (SSP) and predictive analysis to enhance market size and sales (Figure 2.6).



Figure 2.6 Top 10 Thai Food Products that have been exported to member countries of OIC, Source; (www.ditp.go.th)

Applying Philip Kotler's 5.0 marketing strategy, which includes utilizing advanced technologies like AI and big data for personalized customer experiences, is shown to effectively boost sales and predict market trends in the Halal food industry. For instance, the trade of Halal food from Thailand to China can benefit significantly by leveraging these strategies, ensuring high-quality standards and tailored marketing efforts to meet specific consumer needs. The study concludes that combining STP (Segmentation, Targeting, Positioning) with Kotler's 5.0 approach can drive sustainable growth and expand market reach globally, particularly in the Halal food trade.

Table 2.1 Overview of the market for Thai Halal food trade in high potential area.

Rank	Country	Population (million)	GDP (2023)	Halal Food Industry Strengths	Potential of Market Target	Reference
1	Indonesia	276.4	\$1.389 trillion	Largest Muslim population, significant Halal food production and export	No	(Masruroh, 2020)
2	Malaysia	32.7	\$373.4 billion	Major global Halal hub, strong government support and certification systems	No	(Ahmad-Fauzi & Md Saad, 2024)
3	Turkey	85.3	\$905.5 billion	Large Halal food market, key player in Halal meat production	No	(Muchtar et al., 2024)
4	Saudi Arabia	35.8	\$933.4 billion	Significant Halal food consumption, investment in Halal food production	Moderate	(Soonsan & Jumani, 2024)
5	United Arab Emirates	9.9	\$501.4 billion	Major re-exporter of Halal products, strategic location	Moderate	(Soonsan & Jumani, 2024)
6	Pakistan	242.9	\$347.7 billion	Growing Halal food sector, large agricultural base	Moderate	(Sungnoi & Soonthonsmai, 2024)
7	Egypt	104.1	\$387.4 billion	Significant Halal food production and export potential	Moderate	(Utomo & Sari, 2022)
8	China	1,425.7 (26.4)	\$19.374 trillion	Large Muslim population in specific regions, emerging Halal food production but insufficient to fulfill the needs of customer.	Excellent	(Hong et al., 2019)

2.4 Contextual Analysis in Halal Food Trade

(Hakim et al., 2022) investigated the public sentiment towards Halal certification using Twitter data. Utilizing a qualitative approach and VADER, a sentiment analysis tool, they analyzed 13,824 tweets. Their results indicate a positive sentiment of 41.8%, neutral sentiment of 30.8%, and negative sentiment of 27.4%. Their research highlighted that positive sentiments often relate to the benefits of certification in ensuring product quality and religious compliance. Conversely, negative sentiments are often associated with perceptions of discrimination and imposition on non-Muslims. This study also underscored the significance of contextual analysis in understanding public opinion and the potential impact on global Halal food sales. Contextual analysis is essential for understanding consumer perceptions, respecting cultural sentiments, identifying trends, guiding regulatory compliance, gaining competitive advantage, fostering consumer trust, mitigating risks, tailoring global strategies, driving innovation, and predicting sales trends to support the growth of the Halal industry.

(Rahman et al., 2024) envisaged the sentiment analysis on tweets with the hashtag #sijilHalal keyword to understand public perceptions of Halal certification in Malaysia. They employed Natural Language Processing (NLP) techniques and Python libraries for data pre-processing and sentiment classification, resulting in a significant portion of tweets (51%) are related to food, with notable concerns about Halal certification's quality and awareness. The findings highlighted the prevalence of mixed sentiments, with positive mentions mostly linked to food premises and products, while neutral sentiments often relate to the pharmaceuticals and beauty industries. The findings highlighted the critical role of contextual analysis in capturing the nuanced public sentiment towards Halal certification, which can directly influence consumer behavior and market trends. By systematically analyzing social media sentiments, businesses can identify consumer concerns, preferences, and emerging trends, thereby tailoring their marketing strategies and product offerings to meet the demands of the Halal food market. This approach not only enhances market positioning but also fosters consumer trust and loyalty, driving the overall growth of the global Halal industry.

(Olya & Al-Ansi, 2018) explored the various risks associated with Halal products, including health, psychological, environmental, social, quality, financial, and time-loss risks. Using complexity theory, the study develops conceptual models to understand

consumer satisfaction, intention to recommend, and continued use of Halal products. Data collected from international Halal restaurant patrons in Malaysia revealed that health and environmental risks are significant factors influencing these outcomes. Olya used structural equation modeling (SEM) and fuzzy set qualitative comparative analysis (fsQCA) to assess the impact of these risks. The findings highlighted the importance of addressing perceived risks to enhance consumer trust, satisfaction, and loyalty, which are crucial for the profitability of Halal markets in the tourism industry (Figure 2.7).

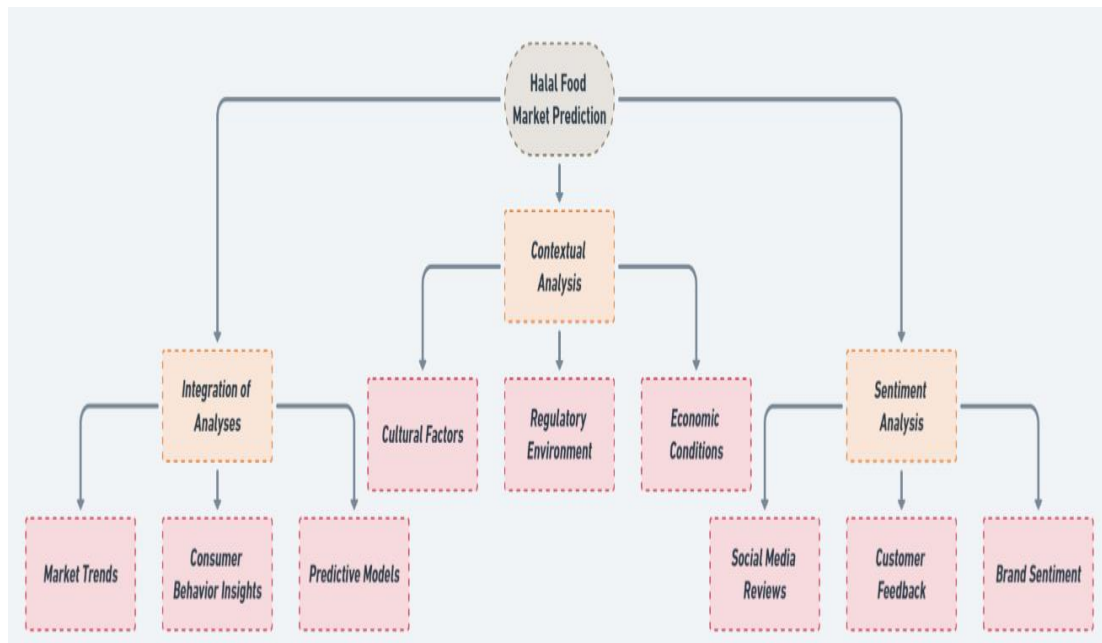


Figure 2.7 Risk assessment in Halal food logistics and trade (Olya & Al-Ansi, 2018)

Contextual analysis in Halal food logistics is crucial for identifying key risk factors, understanding consumer behavior, enhancing trust and loyalty, improving regulatory compliance, supporting strategic decision-making, mitigating financial risks, boosting market competitiveness, informing marketing strategies, enhancing product quality, and driving innovation.

2.5 Predictive Analysis in Halal Food Trading

The global Halal food market has experienced substantial growth, driven by an increasing Muslim population and a rising demand for Halal-certified products. Initially focused on food, the Halal market now extends to cosmetics, pharmaceuticals, logistics, and tourism, with an annual value of approximately USD 2.3 trillion and a growth rate of

20%. Key players in this market include Malaysia, Brazil, and Australia, while emerging markets such as China, Thailand, and the USA show significant potential. In Southeast Asia, Thailand has emerged as a significant player in the Halal food market. By 2019, it had become the 11th largest global exporter, driven by its extensive standardization efforts and government support. Halal food exports constitute 20% of Thailand's total exports, having grown by 19% over five years. Thailand's competitiveness is bolstered by its focus on standardization and its promotion of local wisdom and traditional wealth.

Predicting consumer demand for Halal food products involves the use of advanced analytics and machine learning models. Predictive analytics utilizes data from various sources, such as e-commerce transactions, social media trends, and historical sales data, to forecast future demand accurately. This approach enables businesses to optimize inventory levels, reduce waste, and improve customer satisfaction by ensuring the availability of the right products at the right time. Machine learning models, including clustering algorithms like K-means and sequential models like LSTM, have been employed to analyze consumer data and provide actionable insights. These models can identify patterns and trends that traditional forecasting methods may overlook, thereby allowing businesses to adapt to changing market conditions more effectively. For instance, the use of Python's K-means clustering, and sequential analysis algorithms has proven effective in segmenting the market and predicting sales trends, enabling businesses to tailor their strategies to meet consumer demand during peak seasons such as Ramadan.

Segmentation categorizes the Chinese Halal food market by factors like religious affiliation and shopping behavior, while targeting selects the most appealing segments to optimize resource allocation, market share, and sales potential. (Camilleri, 2020). Understanding Muslim consumers' specific demands, like the importance of the "Halal Logo," allows businesses to gain credibility and appeal by marketing their products as Halal-certified and trustworthy. (Ahmad et al., 2019). Data-driven marketing tools provide insights into consumer behavior and trends for informed decision-making, while modern approaches like content marketing, influencer collaborations, and personalized experiences enhance engagement and brand advocacy through e-commerce and social networking. (Rünzel et al., 2021; Sha et al., 2021; Xu et al., 2018).

Businesses and consumers increasingly use social media and online reviews for product promotion and information, often leading customers to browse in stores but buy online. (Quan et al., 2019). OCRs, considered the second most-trusted information source after personal recommendations, offer valuable insights into product strengths and weaknesses by describing products in various usage scenarios from a consumer's perspective. Despite their usefulness as "sales assistants," analyzing OCRs is challenging due to their volume, variety, and complexity. (Kordrostami & Rahmani, 2020).

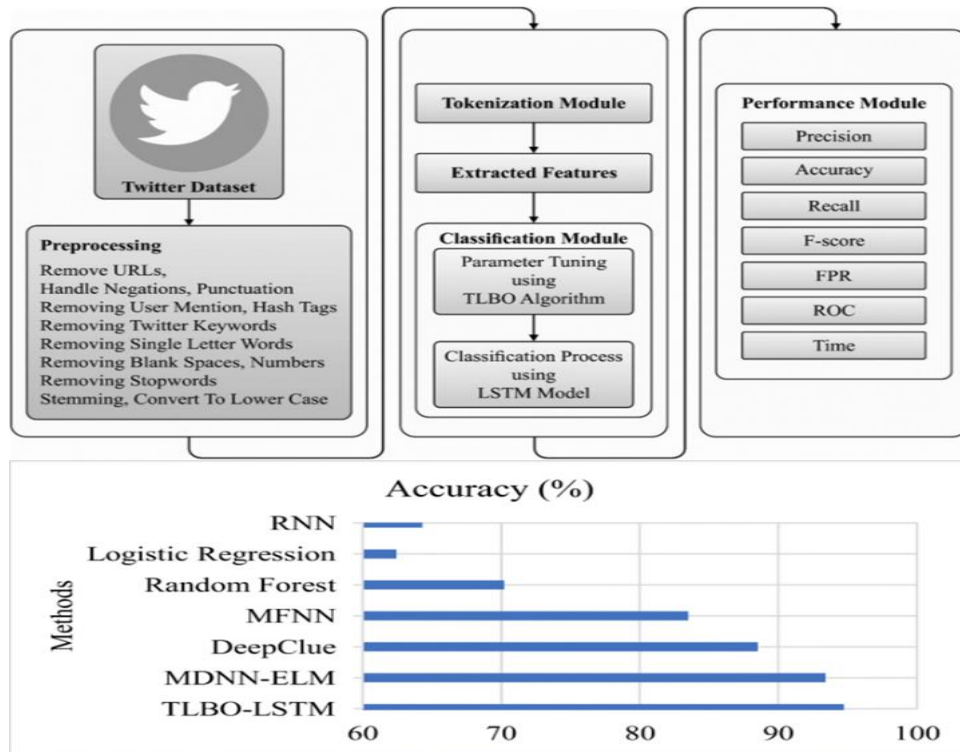


Figure 2.8 Use of LSTM sequence to predict market potential based on consumer's review (Swathi et al., 2022)

Arun Billee and co-workers (Billee et al., 2019) investigated Muslim tourists' expectations for Halal tourism in Songkhla province, Thailand, utilizing a quantitative approach with data from 404 tourists. Their findings indicated high expectations across the 5As: attractions, accessibility, amenities, accommodations, and activities, particularly for Halal food and religious practices sentiments. The study suggests that effective Halal tourism management can significantly enhance tourism value and economic growth in the region.

E-commerce has surged in popularity, with consumer-generated data like ratings and reviews significantly influencing purchasing decisions. Accurate analysis of this data

through Machine Learning and Natural Language Processing provides valuable insights into consumer behavior, helping e-commerce businesses understand consumer intentions and preferences (Shrirame et al., 2020). This data impacts consumer purchasing intentions, allowing for real-time, personalized recommendations that enhance the shopping experience and boost organizational profits. This study explores factors that guide organizational strategies through the analysis of extensive user-generated content.

Deep learning analysis for market prediction employs a range of algorithms to achieve accurate visualization of big data through keywords and sentiment analysis. Key algorithms include Support Vector Machine (SVM), Random Forest, and Naïve Bayes for initial classification and prediction. Advanced techniques such as Convolutional Neural Networks (CNN) and Recurrent Neural Networks (RNN), particularly Long Short-Term Memory (LSTM) networks, are used to capture temporal dependencies and complex patterns in the data (Swathi et al., 2022). The N-CRBM (Neighborhood Conditional RBM) model, coupled with Contrastive Divergence (CD) for optimization, enhances the learning of contextual relationships. Sentiment analysis leverages Natural Language Processing (NLP) algorithms, while K-Mean clustering segments the data into meaningful groups. The Net Promoter Score (NPS) further aids in understanding customer loyalty and satisfaction, leading to comprehensive market insights and predictions (Figure 2.9).

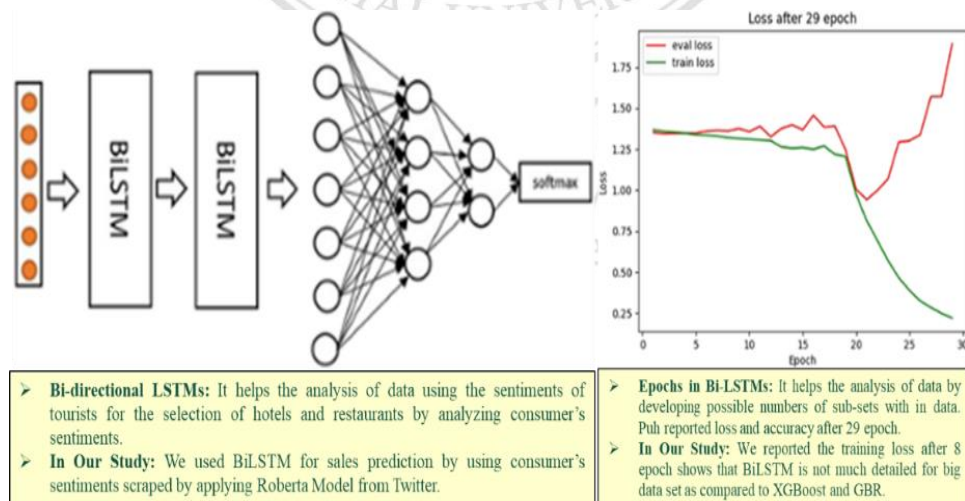


Figure 2.9 Bi-directional LSTM in predictive analysis using data sentiments (Puh & Bagić Babac, 2023)

(Sari et al., 2024) explored the integration of sustainable strategic planning and management (SSPM) in the Halal culinary MSMEs in the SEA region. The sustainable practices such as green resource management (GRM), digital transformation management (DTM), and Halal business management (HBM) significantly contribute to the long-term success and sustainability of these enterprises have widely been explained. Their findings displayed that SSPM positively impacts economic, social, and environmental performance, aligning with Islamic ethics and good governance principles. This approach enhances operational efficiency, market competitiveness, and environmental preservation. The findings advocate for periodic evaluations and stakeholder involvement in SSPM practices to ensure continuous improvement and sustainability (Figure 2.10).

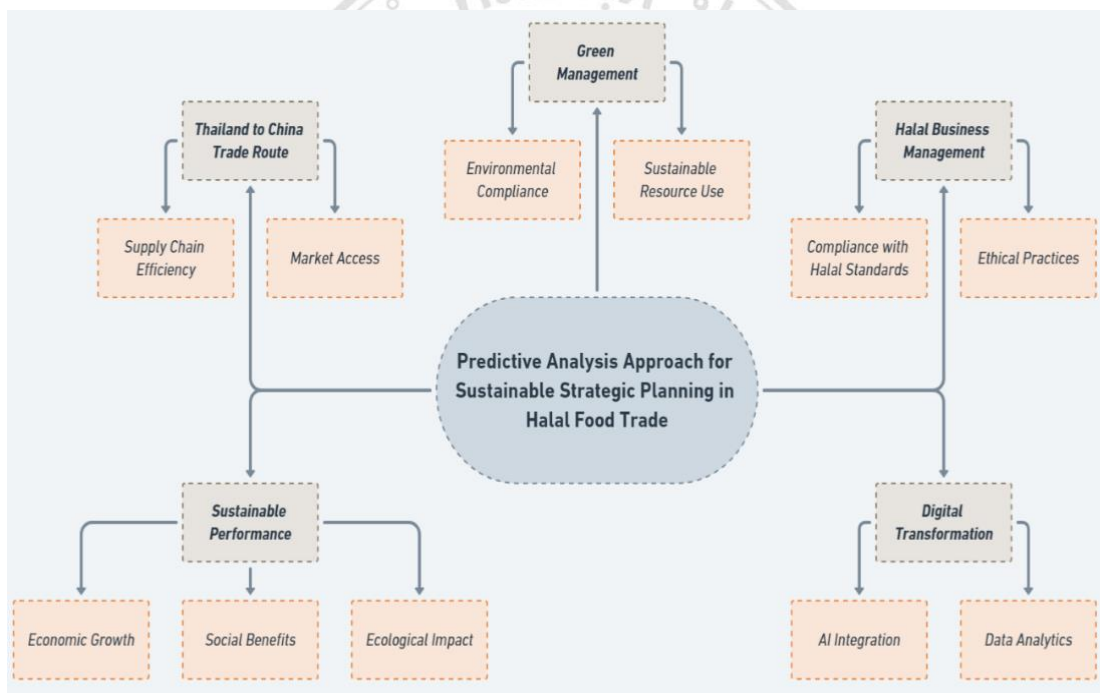


Figure 2.10 Sustainable strategic planning and management influence on sustainable performance: findings from Halal culinary MSMEs in Southeast Asia

They explained the application of their model relevant to the Halal food trade between Thailand and China. By adopting SSPM, Thailand can strengthen its Halal certification processes, improve supply chain management, and enhance the quality and trust in its Halal products. This strategic planning can help Thailand expand its market in China, leveraging the growing demand for Halal food and ensuring sustainable economic growth while maintaining high standards of food safety and ethical consumption.

(Kittipanya-Ngam & Tan, 2020) studied the impact of digital technologies on Thailand's food supply chain (FSC). Their study gives insights to the significance of digitalization in enhancing transparency, traceability, safety, and sustainability, which are increasingly demanded by consumers and regulators. Using case studies from Thailand's poultry, canned tuna, and rice supply chains, the authors identify key challenges and opportunities, such as the need for real-time data, blockchain for authenticity, and IoT for smart farming (Figure 2.11).

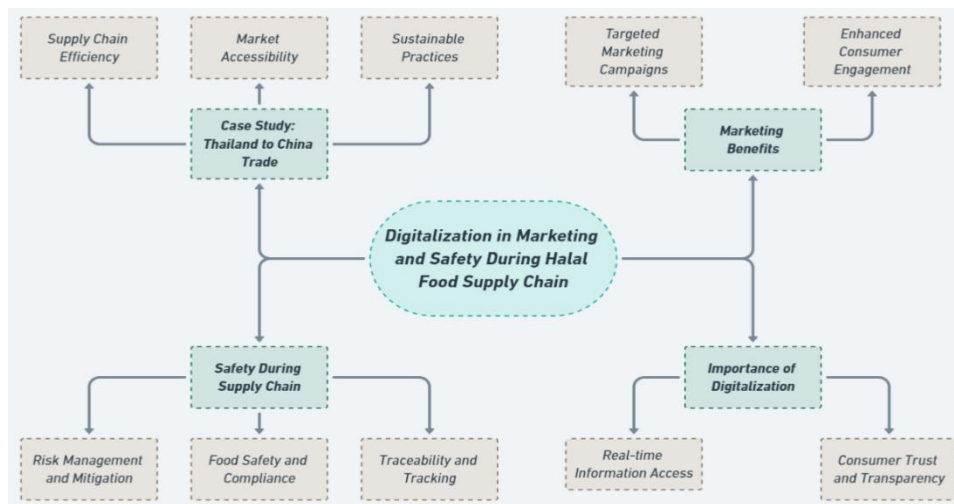


Figure 2.11 A framework for food supply chain digitalization from Thailand (Kittipanya-Ngam & Tan, 2020)

The findings suggested that digitalization improves efficiency and productivity, particularly in complex supply chains like poultry and tuna, where traceability and sustainability are critical. The framework proposed underscores the role of technology in transforming FSCs, emphasizing the importance of inter-firm collaboration and regulatory compliance. This approach can significantly enhance market competitiveness, reduce waste, and improve consumer trust, making it crucial for the sustainable growth of Thailand's food exports.

(Joseph et al., 2022) investigated the use of a hybrid deep learning framework combining Convolutional Neural Network (CNN) and Bidirectional Long Short-Term Memory (BiLSTM) with Lazy Adam optimization for accurate demand forecasting. This novel framework demonstrated superior performance compared to traditional methods, achieving higher accuracy and lower error rates (MAE, MAPE, R2). Their findings revealed that the model's ability to predict market size and after-sale trends is highly effective, providing a reliable tool for sustainable strategic planning. Applying this model

to the Halal food trade between Thailand and China, predictive accuracy can enhance inventory management, reduce overstock and stockouts, and optimize supply chain efficiency. This approach aligns with Philip Kotler's Marketing 5.0 strategy, which emphasizes leveraging advanced technologies for personalized and efficient market solutions. The model's success in predicting market trends highlights its potential to boost Halal food exports, ensuring Thailand meets the growing demand in China while maintaining high standards and consumer trust.

(Puh & Bagić Babac, 2023) envisaged various machine learning models to predict sentiments and ratings from tourist reviews. Models such as Naive Bayes, Support Vector Machines (SVM), Convolutional Neural Networks (CNN), Long Short-Term Memory (LSTM), and Bidirectional Long Short-Term Memory (BiLSTM) were used. Among these, the BiLSTM model demonstrated superior performance with an accuracy of 72% for rating prediction and 89% for sentiment classification. The findings highlight that deep learning models, especially BiLSTM, are more effective and accurate than traditional machine learning algorithms (Figure 2.12).

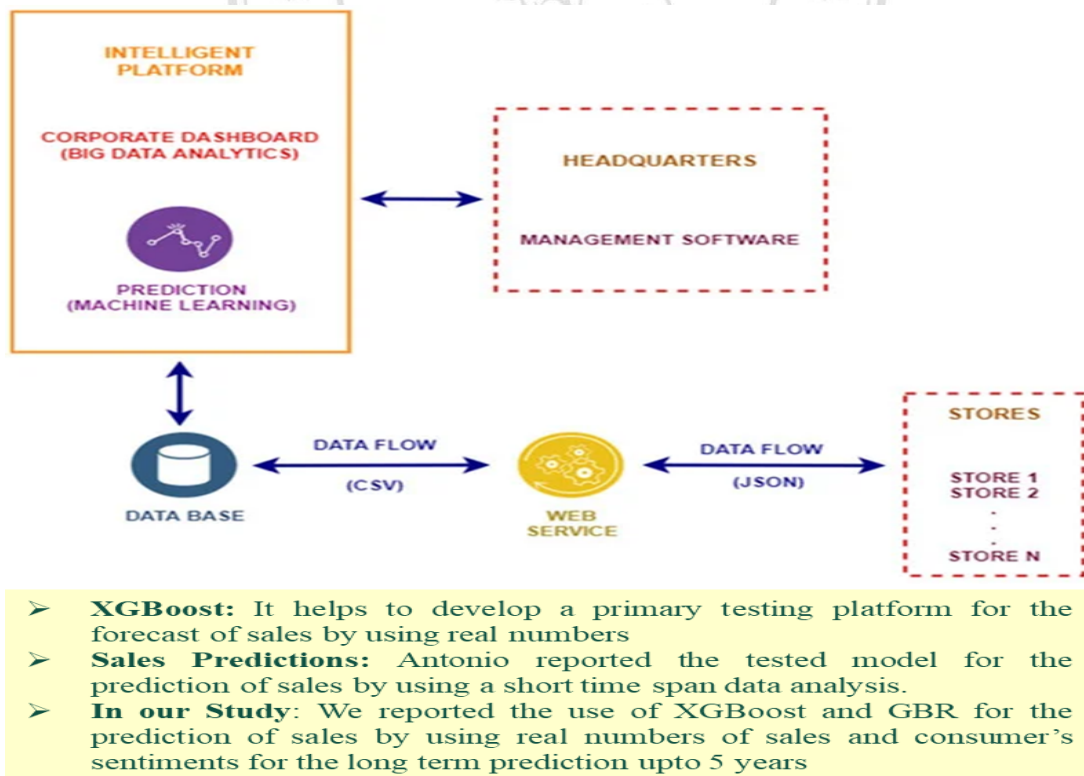


Figure 2.12 XGBoost and GBR model for the prediction of the best product (Panarese et al., 2022)

The practical implications of this study include improved forecasting of tourist arrivals, customer satisfaction analysis, and enhancement of marketing strategies. This predictive analysis approach can be applied to the Halal food trade between Thailand and China. By utilizing the LSTM and BiLSTM models, Thailand can better predict market trends and consumer preferences in China, optimize supply chain management, and tailor marketing efforts to meet specific consumer demands. This strategic use of advanced predictive models can significantly enhance Thailand's competitive edge in the Halal food market, ensuring sustainable growth and increased exports to China.

In this study, we focused on the prediction of the Halal food market in China, specifically with the concern of Thai Halal Food by using a sales and sentiment analysis approach. In literature, various models for predictive analysis have already been deployed and explored widely. In this customer-centric study, we used three models to test our data set, based upon the appropriate match with the data set and variables to be analyzed. Our study revealed meaningful outcomes to mitigate the challenges related to the prediction of market size, the use of accurate products to invest with, and the prediction of projected sales in the future by using LSTM, BiLSTM, XGBoost, and GBR algorithms. Details have been explained in the next section with the research framework.

Overall, the combination of marketing strategies, data-driven technologies, and strategic positioning will greatly help Halal food enterprises in China's e-commerce sector. Businesses that understand customer requirements, target the proper segments and successfully position their products can gain a competitive advantage and drive growth in this dynamic and growing market.

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CHAPTER 3

METHODOLOGY

3.1 Research Design

This study will investigate how Thai Halal food could strengthen Thailand's impact on the Chinese market. We also employ sales and contextual analysis to determine customer's learning behavior and sentiments regarding Halal food and Thai Halal food. We aim to present a comprehensive analysis of Thai Halal food's potential as a supporting scheme for sales prediction tools in China by integrating quantitative approaches, contextual, sentiment analysis, and mathematical algorithms.

This section will be focused on the structured approach utilized in this research to develop a comprehensive, data-driven framework for predicting consumer demand and conducting contextual analysis to enhance agile marketing strategies for the Halal food trade between Thailand and China via e-commerce platforms (Figure 3.1).

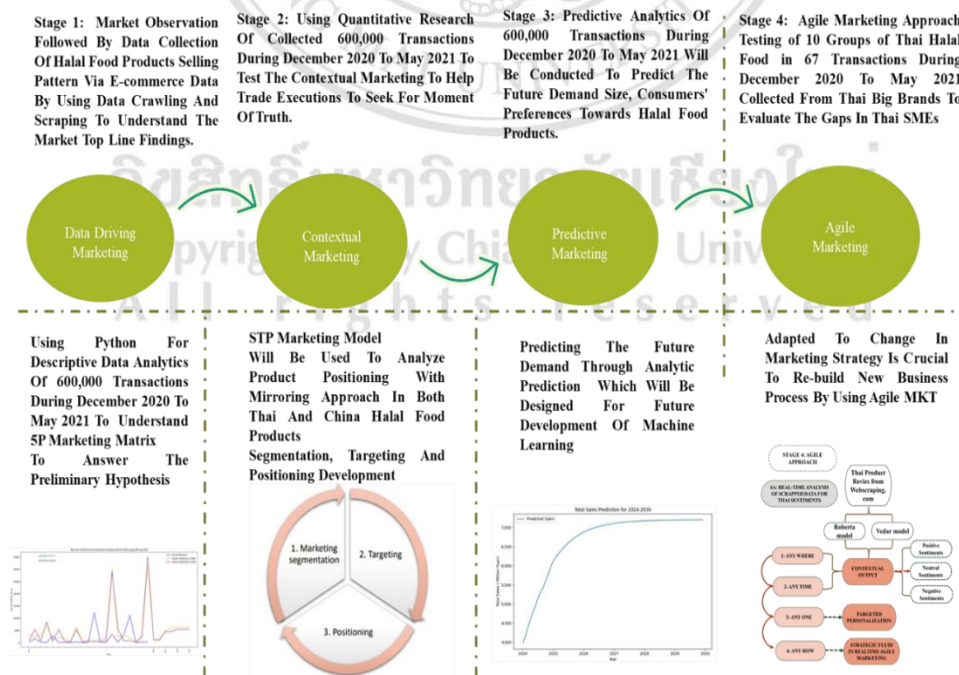


Figure 3.1 The model roadmap leads to the novelty Stage1-4

This chapter begins by detailing the research design, which incorporates both qualitative and quantitative methodologies to ensure a robust analysis. The data collection methods are then outlined, emphasizing the use of various sources such as e-commerce transactions, research reviews, and market trends. Advanced analytical techniques, including machine learning models like LSTM, BiLSTM, XGBoost, and GBR, are employed to forecast consumer demand accurately. Contextual analysis is also a critical component, examining cultural, economic, and market-specific factors influencing demand, with particular attention to sentiment analysis. The chapter concludes by describing the process of developing and validating agile marketing strategies informed by these predictive and contextual insights, ensuring that the marketing approaches are both responsive and effective in addressing the dynamic nature of the e-commerce environment (Figure 3.2).

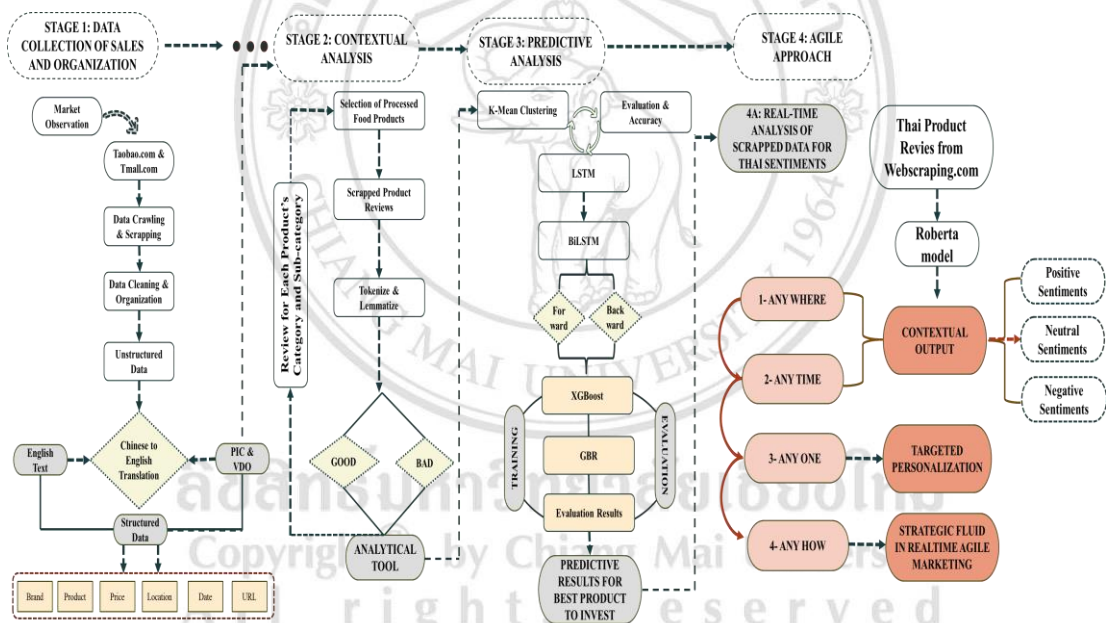


Figure 3.2 Framework of Research Methodology

3.2 Stage 1: Data Collection of Sales and Organization

To understand Halal food market dynamics during Christmas, New-year, Chinese New-year, Pre-Ramadan, and Post-Ramadan data from Taobao, Tmall, and official trade statistics will be collected, focusing on sales, transactions, and import/export data across pre-Ramadan, Ramadan, and post-Ramadan periods using crawling and scraping techniques with strict quality control (Figure 3.3).

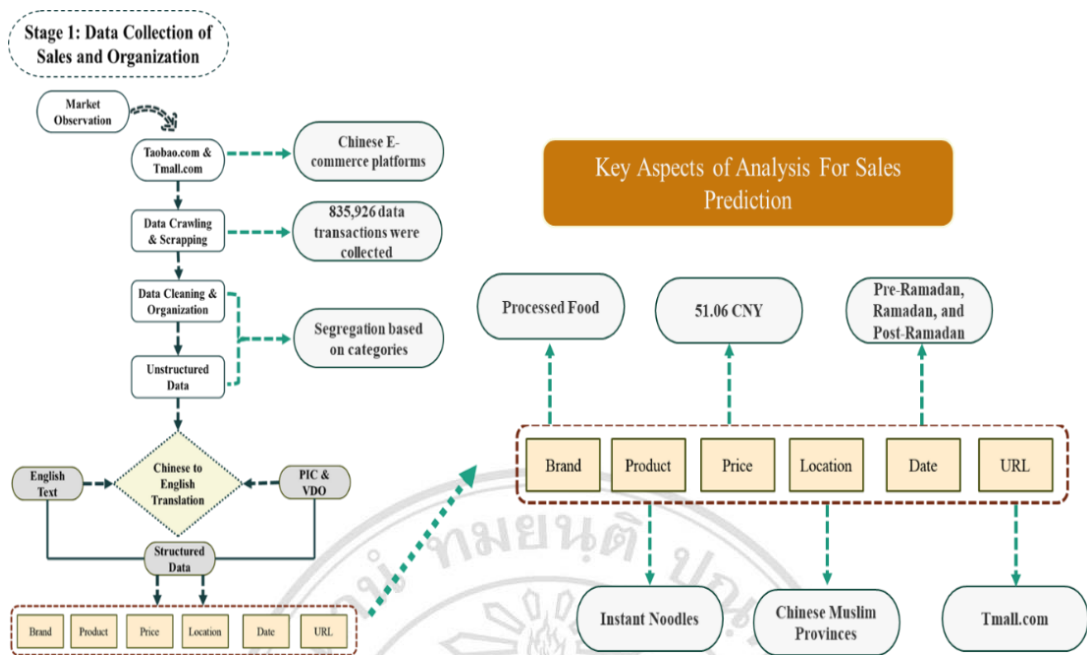


Figure 3.3 Stage 1: Market observation and data collection

3.2.1 Primary and Secondary Data Integration

Our primary qualitative data collection will be spanned various online platforms, including social media channels such as WeChat, and relevant databases for Chinese Government sources. Embracing both English and Chinese sources, we curated a comprehensive dataset. Additionally, we will conduct structured interviews with experts and customers who are familiar with Thai Halal food in the Chinese market, and e-commerce platforms such as Tmall and Taobao, which have a significant impact on consumer behavior in China.

Secondary data from market reports will be integrated into the analysis. This includes reports on market trends, consumer behavior, and economic indicators related to the Chinese market for Halal products. The combination of primary and secondary data will provide a comprehensive understanding of the market dynamics and consumer sentiments of overall collected transactions through web-scraping and web-crawling of Taobao.com and tmall.com.

Data collection will be centered sourcing consumer reviews of Halal food from social media, forums, and e-commerce sites such as Taobao.com and Tmall.com. The data will be cleansed and organized using NLP techniques, including text normalization, tokenization, lemmatization, and the removal of stop words. This process

will ensure a focus on significant keywords. Sentiment analysis categorized consumer reviews into positive, negative, or neutral sentiments and will analyze keyword frequency. Overall, the combined quantitative and qualitative analysis will provide a valuable insight of consumer perceptions and market trends in the Chinese market for Thai Halal food Preprocessing.

Product names and reviews underwent further processing to identify key terms and patterns accurately. The dataset was refined by eliminating non-essential words, punctuation, and numbers. Tokens were ranked based on their occurrence frequency to identify dominant themes and trends (Smith & McCarthy, 2022).

3.2.2 Market Segmentation

After data collection, segmentation analysis with group analysis and Python's K-means clustering will identify unique market categories, enabling customized marketing strategies, while predictive analytics using historical sales data forecasts 'Total Sales Per Unit' for Halal food products from 2024-2030 by following equation number 1 (Janićijević et al., 2020).

$$\bar{X} = \frac{1}{N} \sum_{i=1}^N X_i \quad (1)$$

Here, \bar{X} denotes the cluster centroid, N is the number of data points in the cluster, and X_i represents the features of each data point within the cluster. This clustering enables us to discern distinct behavioral patterns and sales dynamics within segments of the Halal food market (Figure 3.4).

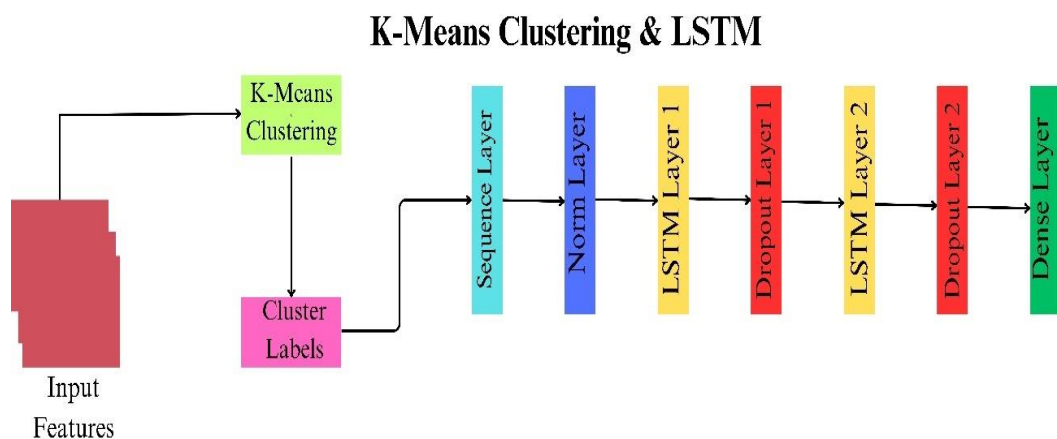


Figure 3.4 Workflow diagram of K-means clustering and LSTM models

3.3 Stage 2: Contextual Analysis and Implementation

In the second stage, we will analyze the impact of Ramadan on the Chinese Halal food sector and implemented strategies to leverage this insight by using the overall collected 825,962 entries of the dataset. Furthermore, the contextual analysis was performed using 600,000 tokenized and cleaned data to specify the best-selling product to invest in, Using Python's sequential analysis algorithm, we enhanced our analysis to develop effective marketing strategies, and a deep understanding of the evaluation of big data based upon customer reviews concentrating the contextual analysis approach to segmentize, target and to position the market size and customer range (Figure 3.5).

Time-based analysis: The methodology for analyzing Halal food sales during Ramadan uses Python libraries like pandas, matplotlib, and stats models for processing data, visualizing trends, and applying time series analysis to understand consumer behavior. Sequential analysis algorithms refine forecasting models in real-time, aiding in adaptive inventory and supply chain management, thus optimizing operations and marketing strategies for increased profitability.

Consumer behavior analysis: The research methodology uses Python for sequential analysis to understand consumer behavior during Ramadan, starting with collecting and preprocessing purchase data. Sequential analysis techniques identify patterns and trends, with statistical methods calculating metrics like purchase frequency and average basket size, illustrated through visualizations. Insights reveal peak shopping times and popular product categories, informing business recommendations for adjusting marketing strategies, product offerings, and inventory management to better meet customer needs during Ramadan.

Competitive Analysis: Our study leverages Python and sequential analysis to comprehensively analyze marketing activities, pricing strategies, and distribution channels in the Halal food market during Ramadan, identifying trends and strategic opportunities for optimized marketing and strategic positioning (Figure 3.4).

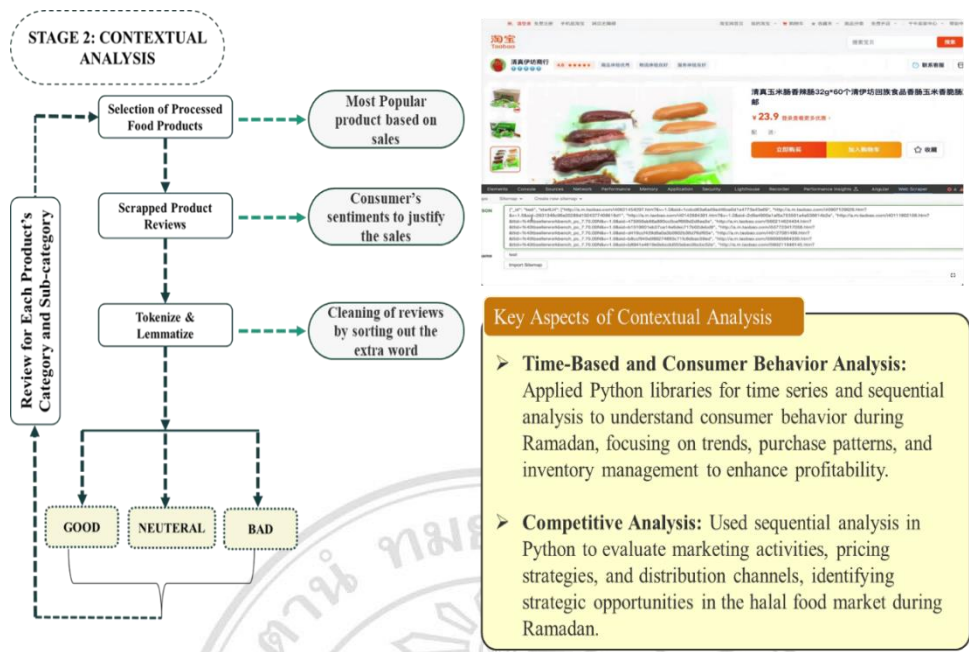


Figure 3.5 Stage 2: Scrawling and contextual analysis of collected data

3.4 Stage 3: Predictive Analysis

Predictive analytics with Python libraries like scikit-learn and Tensor-Flow improves forecasting models using historical data to predict future Halal food purchase trends during Ramadan. Sequential analysis algorithms refine these models in real-time, enabling proactive adjustments in inventory and supply chain management to increase profitability (Figure 3.6).

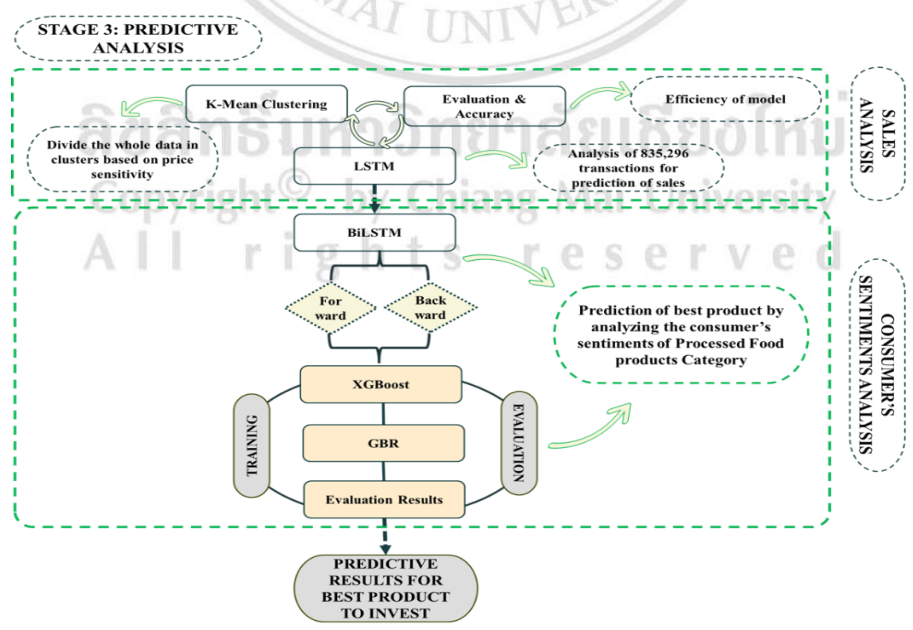


Figure 3.6 Stage 3: Implementation of mathematical models in python to analyze the big data to predict the market potential

3.4.1 LSTM/Sequential Algorithm

In the second stage of using LSTM/sequential algorithms, it helps the running LSTM cells' information flow by using the big data set of 835,926 transactions, involving sigmoid and hyperbolic tangent functions, essential for effectively processing sequential data like text or time series. This will provide a deep learning of big data set in a sequence based on time of sale and the price to predict the outcomes in sales. LSTM is crucial for processing sequential data and capturing long-term dependencies, making it ideal for forecasting consumer demand patterns over time. Its ability to handle time series data accurately is essential for predicting trends in the Thai Halal food market during specific periods like Ramadan.

Normalization:

$$\text{Normalized vaule} = \frac{\text{value} - \text{min}}{\text{max} - \text{min}} \quad (2)$$

Where (min) and (max) are the minimum and maximum values in the dataset.

Sequence Creation:

Given a time series $\{x_1, x_2, \dots, x_T\}$, sequences of length `seq_length` is created:

$$X = \{(x_i, x_{i+1}, \dots, x_{i+\text{seq_length}-1}) | i = 1, 2, \dots, T - \text{seq_length}\} \quad (3)$$

$$Y = \{x_{i+\text{seq_length}} | i = 1, 2, \dots, T - \text{seq_length}\} \quad (4)$$

LSTM Model:

The LSTM model consists of two LSTM layers with Dropout for regularization:

$$h_t = LSTM(x_t, h_{t-1}) \quad (5)$$

Where;

- h_t represents the hidden state at time t . The hidden state is the internal state of the LSTM cell that is updated at each time step and carries information from previous time steps.
- x_t is the input at time t . It is the external data fed into the LSTM cell at the current time step.
- h_{t-1} represents the hidden state from the previous time step $t-1$. It is used by the LSTM cell to maintain a connection with past information

Loss Function:

The model uses Mean Squared Error (MSE) as the loss function:

$$MSE = \frac{1}{N} \sum_{i=1}^N (y_i - \hat{y}_i)^2 \quad (6)$$

Where;

- **MSE**: Mean Squared Error, which is used as the loss function. It measures the average squared difference between the actual values and the predicted values.
- **N**: The number of samples in the dataset.
- y_i : The actual value for the i -th sample.
- \hat{y}_i : The predicted value for the i -th sample.

In the analysis and implementation stage, key functions like normalization and sequence construction, along with LSTM models and Mean Squared Error loss, enhanced time-based analysis, predictive analytics, and consumer behavior understanding for informed decision-making.

3.4.2 Bidirectional LSTM (BiLSTM)

In the context of e-commerce in Thailand, BiLSTM (Bidirectional Long Short-Term Memory) networks are highly effective for processing sequential data such as consumer purchase histories, browsing patterns, and online reviews. By analyzing data bidirectionally, both forward and backward BiLSTM captures dependencies from both past and future states, thereby enhancing the model's accuracy in predicting consumer

behavior and market trends. This method maps input data, such as user interactions and product preferences, into dense vectors that understand the underlying relationships between variables. The outputs from both directions are then combined to make more accurate predictions. This bidirectional approach is particularly useful for sentiment analysis and other sequential data tasks in e-commerce, enabling businesses to better understand customer needs and optimize their marketing strategies. As shown in Figure 3.7, this approach plays a crucial role in improving the effectiveness of predictive models for Thailand's growing e-commerce sector. (Figure 3.7).

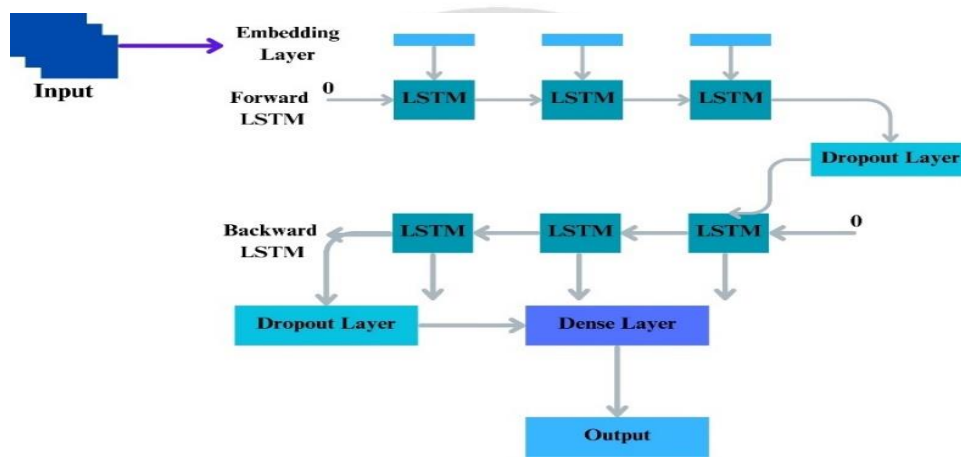


Figure 3.7 Block diagram of BiLSTM working model for predictive analysis

Training:

Loss Function: Use a suitable loss function like binary cross-entropy for binary classification tasks.

Optimization Algorithm: Optimize the model using algorithms like Adam or RMSprop to minimize the loss function.

Evaluation:

Metrics: Evaluate the model on the test set using metrics such as accuracy, precision, recall, and F1-score.

- **Forward LSTM:**

$$\begin{aligned}
 f_t &= \sigma(W_f \times [h_{t-1}, x_t] + b_f) \\
 i_t &= \sigma(W_i \times [h_{t-1}, x_t] + b_i) \\
 \check{C}_t &= \tanh(W_c \times [h_{t-1}, x_t] + b_c) \\
 C_t &= f_t \times C_{t-1} + i_t \times \check{C}_t \\
 o_t &= \sigma(W_o \times [h_{t-1}, x_t] + b_o) \\
 h_t &= o_t \times \tanh(C_t)
 \end{aligned}
 \tag{7}$$

Where:

f_t : Forget gate's activation vector at time t . Determines what information to discard from the cell state.

i_t : Input gate's activation vector at time t . Determines what new information to store in the cell state.

\tilde{C}_t : Candidate cell state at time t . Represents the new candidate values that could be added to the cell state.

C_t : Cell state vector at time t . Maintains the long-term memory of the LSTM.

o_t : Output gate's activation vector at time t . Determines what information to output from the hidden state.

h_t : Hidden state vector at time t . Represents the output of the LSTM cell for the current time step.

W_f, W_i, W_C, W_o : Weight matrices for the forget, input, candidate, and output gates, respectively.

b_f, b_i, b_C, b_o : Bias vectors for the forget, input, candidate, and output gates, respectively.

σ : Sigmoid activation function. It squashes the input values between 0 and 1.

\tanh : Hyperbolic tangent activation function. It squashes the input values between -1 and 1.

h_{t-1}, x_t : Concatenation of the hidden state from the previous time step h_{t-1} and the input at the current time step x_t .

- **Backward LSTM**: Similar to the forward LSTM but processes the sequence in reverse order and the overall output is analysed by equation 8.

$$y_t = Dense\left(\begin{bmatrix} \rightarrow \\ h_t \\ \leftarrow \\ h_t \end{bmatrix}\right) \quad (8)$$

3.4.3 XGBoost

XGBoost is an ensemble learning method based on gradient boosting that builds sequential decision trees. Each tree corrects errors made by the previous ones, and it is known for its speed and performance in various machine learning tasks (equation 9-10). It extracts the data features e.g., sentiment score, price from the dataset and split it

into testing sets to train them. XGBoost is a powerful ensemble learning method known for its speed and performance in predictive modeling tasks. It effectively handles large datasets and complex interactions between variables, making it ideal for accurate demand forecasting and identifying influential factors in consumer behavior (Figure 3.8).

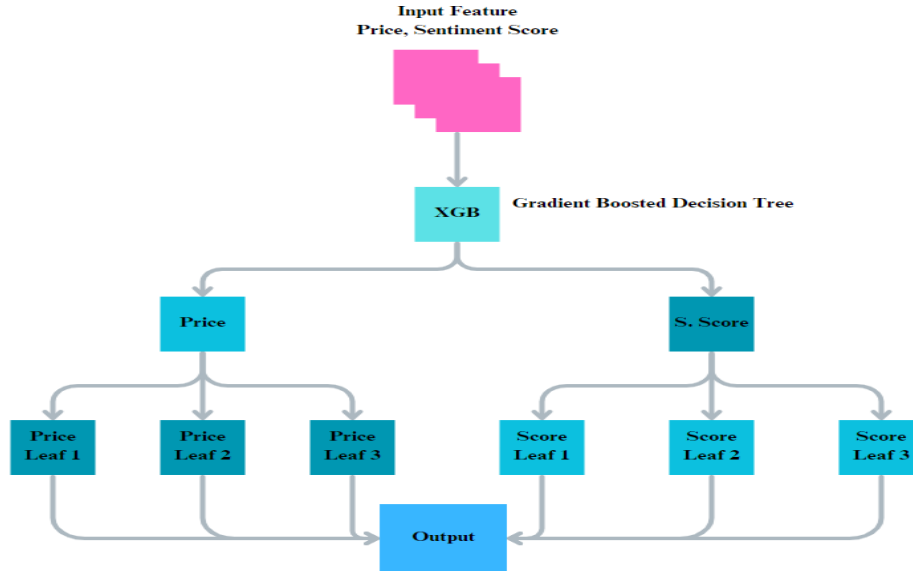


Figure 3.8 Block diagram of working model of XGBoost for predictive analysis using consumer's sentiments.

Model Training:

Set hyperparameters like the number of trees (n_estimators), learning rate, and maximum depth of trees. The model is trained on the training set to minimize the loss function, typically mean squared error for regression tasks.

Evaluation:

Predictions were made on the test set and the Model's performance was evaluated using RMSE (Root Mean Squared Error) and other relevant metrics.

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$$L(\theta) = \sum_{i=1}^n l(y_i, \hat{y}_i) + \sum_{k=1}^K \Omega(f_k) \tag{9}$$

where l is the loss function (e.g., squared error), and Ω is a regularization term. Predictions were made using equation 10.

$$\hat{y}_i = \sum_{k=1}^K f_k(x_i) \tag{10}$$

where f_k represents the $k - th$ tree in the ensemble.

3.4.4 Gradient Boosting (GBR) Algorithm

GBR is another ensemble method that builds a sequence of weak learners (typically decision trees). Each subsequent model attempts to correct errors made by the previous models by focusing on the residuals (equation 11-12). GBR builds a sequence of weak learners to improve predictive accuracy by focusing on correcting errors from previous models. Its ability to enhance prediction through iterative refinement is crucial for developing precise marketing strategies based on historical sales data and consumer reviews (Figure 3.9).

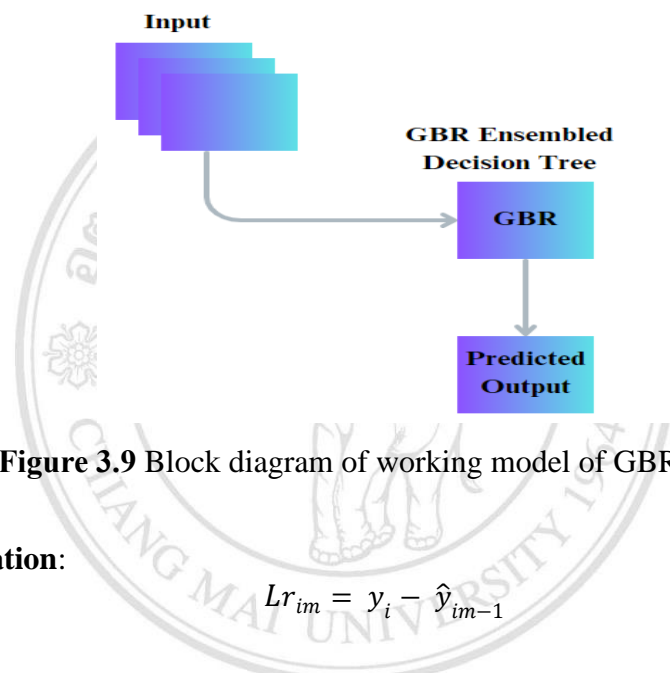


Figure 3.9 Block diagram of working model of GBR

Residual Calculation:

$$Lr_{im} = y_i - \hat{y}_{im-1} \quad (11)$$

$$\hat{h}_m = \hat{y}_{im-1} + \lambda \hat{h}_m(x_i) \quad (12)$$

where λ is the learning rate.

3.5 Stage 4: Agile Marketing Approach

The traditional marketing mix, originally built on the classic "4P" model, has grown to include three additional elements—people, physical evidence, and process—due to the intricate nature of high-tech solutions (Cvetek et al., 2018). We used the scrapped data of 67 best Thai food products to measure the consumer's reviews for the better and précised contextual analysis to foresee the sentiments for Thai Halal food and the comparison with Chinese consumer to predict the best product to invest on. The contextual analysis and predictive insights derived from this research are pivotal for developing agile and effective marketing strategies, positioning Thai Halal food as a significant soft power tool

in China's e-commerce landscape. Natural language, used for human communication, is complex and lacks explicit rules, unlike programming languages. NLP (Natural Language Processing) converts natural language into mathematical notation to extract meaningful information, facilitating technologies like chatbots and web search engines. NLP is crucial in a multilingual society and serves as a valuable marketing tool by analyzing data from social networks, research articles, and forums to identify trends.

3.5.1 Natural Language Processing (NLP)

In language modeling, the modeling component is the n-gram, which consists of one word or a sequence of words of length n . The primary objective is to establish an n-gram language model for $P(x|G_1)$, where P is the probability that a given text x belongs to group G_1 , or $P(x|G_2)$, where P is the probability that the text x belongs to group G_2 . Simple Bayes' rule can be applied for classifying new text into these two groups (Cohen, 2022; Russell & Norvig, 2016).

$$P(x|G_1) = \frac{P(G_1|x)P(x)}{P(G_1)} \quad (13)$$

For G_2

$$P(x|G_2) = 1 - P(x|G_1)$$

There are two models: Roberta and Vader. The Twitter link uses the Roberta model, which has been trained with a dataset from Twitter. The model will yield different results depending on the data used for training. In this study Roberta Model, which has been trained with Twitter data to analyze the sentiments. The research framework illustrated in this study underscores the critical role of Agile marketing in enhancing real-time, fast-paced marketing strategies. Stage 4 of the framework, termed "Agile Approach," is integral to achieving the 4A principles: Any Where, Any Time, Anyone, and Any How. These principles facilitate contextual scope, targeted personalization, and strategic fluidity in real-time agile marketing on a data set of a controlled group, ensuring that marketing efforts are responsive, adaptable, and efficient (Figure 3.10). Roberta and Vedar models were used to pull out the consumers sentiments from social media platforms such as Twitter.

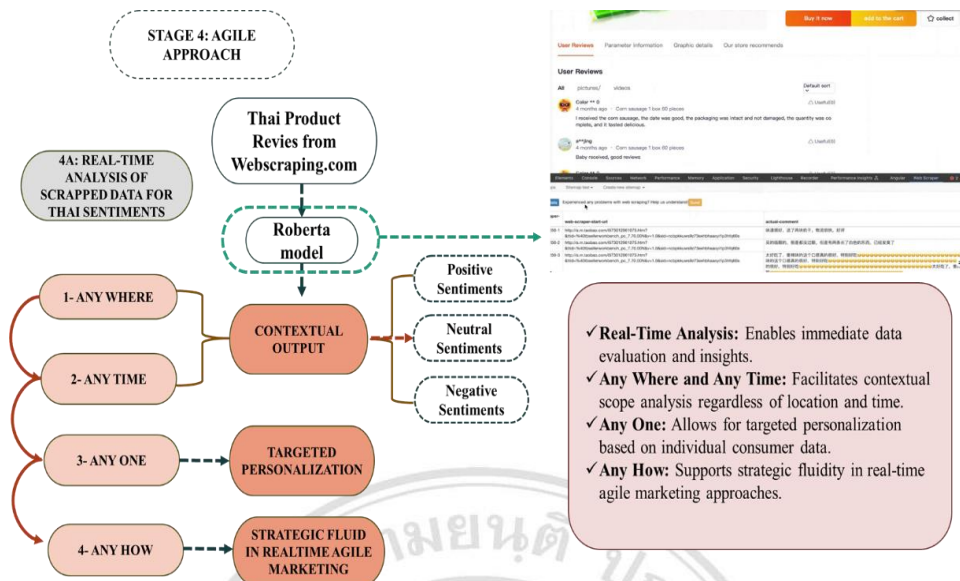


Figure 3.10 Stage 4: Agile approach to cadre the real time analysis issues

3.6 Chapter Summary

In conclusion, this chapter meticulously outlines the structured methodology employed to analyze and predict consumer demand for Thai Halal food in the Chinese market, emphasizing a blend of qualitative and quantitative approaches. The integration of advanced analytical techniques, including LSTM, BiLSTM, XGBoost, and GBR models, ensures accurate forecasting of market trends. By leveraging primary and secondary data sources, this study provides a comprehensive understanding of market dynamics and consumer sentiment.

By integrating the 4A principles with the 4P marketing strategy—Product, Price, Place, and Promotion—this approach introduces a novel and virgin strategy that significantly accelerates real-time marketing analysis. The Agile marketing framework enables businesses to swiftly adapt to market changes, target specific consumer segments more effectively, and personalize marketing messages to enhance consumer engagement.

The integration of these strategies, particularly in the context of real-time marketing, allows for a more dynamic and responsive approach. This ensures that marketing campaigns are not only timely but also highly relevant to the target audience, thus optimizing marketing efforts and improving overall business outcomes. By leveraging advanced predictive analytics and contextual analysis, businesses can gain

deeper insights into consumer behavior and market trends, which are crucial for making informed decisions in a fast-paced e-commerce environment.

In conclusion, the Agile marketing framework and the 4A principles, when combined with the 4P, offer a powerful toolkit for businesses aiming to excel in real-time marketing. This approach not only enhances the speed and accuracy of marketing analysis but also ensures that marketing strategies are both adaptive and impactful, thereby driving greater success in today's competitive market landscape (Figure 3.11).

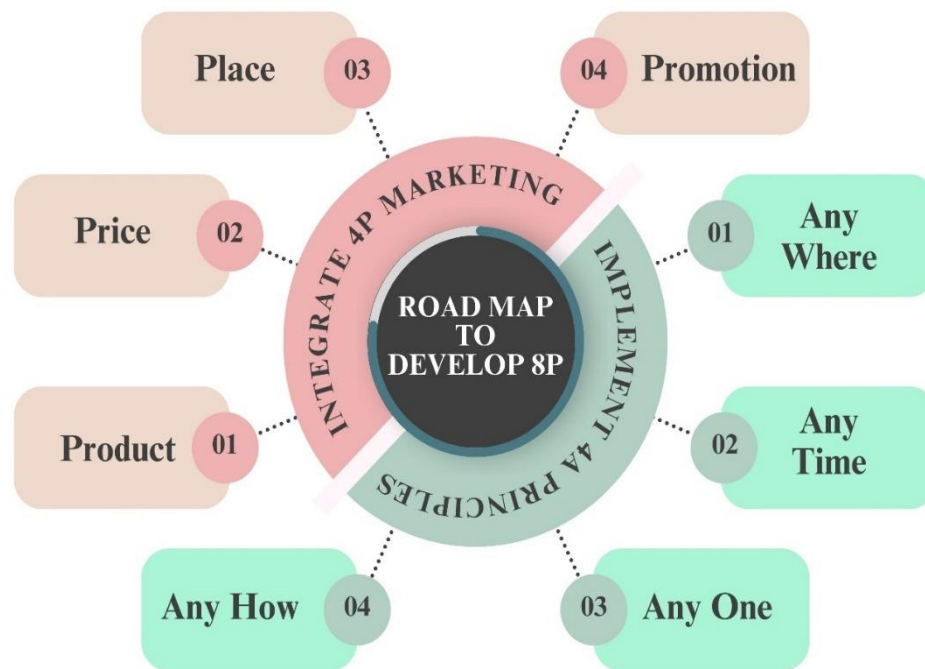


Figure 3.11 A road to empower the soft powers of Thailand by integrating 4A and 4P to build 8P.

Figure 3.11 outlines a roadmap for transitioning from the 4A principles (Anywhere, Any Time, Anyone, Any How) and 4P marketing strategy (Product, Price, Place, Promotion) to a more advanced 8P strategy. This progression aims to strengthen Thailand's three major soft powers by integrating and implementing these foundational marketing principles effectively

CHAPTER 4

RESULTS

4.1 Sales analysis during the festive period (This part has been published in journal) (Srikasem et al., 2024)

Through a data-analytics marketing model analyzing transactional data from Taobao.com and Tmall.com, we aim to understand Halal food purchasing patterns in China, focusing on categories, seasonality, pricing, and real-time demand prediction, revealing significant fluctuations in seasoning sales during major festivals and a preference for chicken and meat in ready-to-eat formats, informing product development strategies to meet local and international consumer demands. (Figure 4.1).

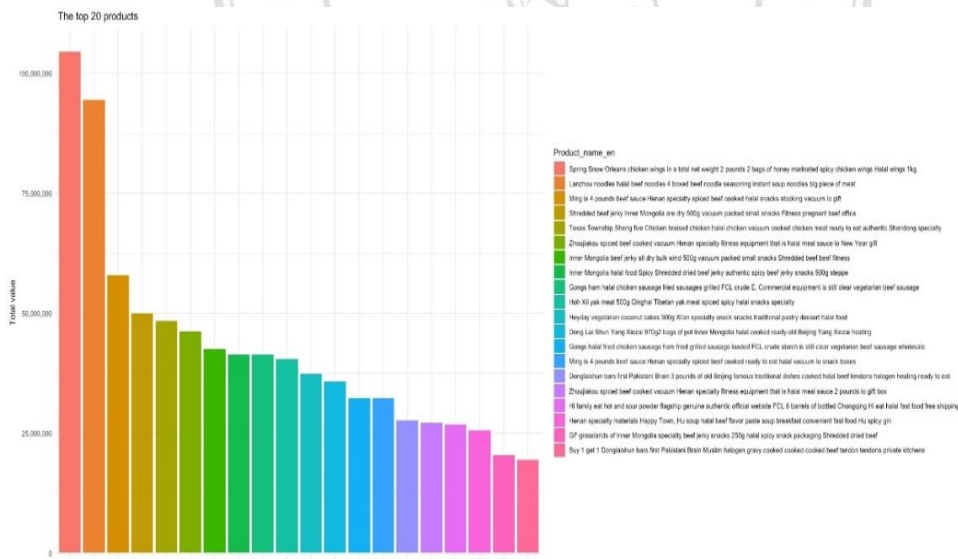


Figure 4.1 Contribution of the Holy Month of Ramadan towards the best-selling products.

The sales patterns of three major ingredients crucial in preparing ready-to-serve Halal food in China were studied, focusing on the number of items sold and revenue generated over time. Seasoning, vital for flavor and aroma in global cuisine, particularly crucial in Halal food, was chosen as one of the sample sets. (Figure 4.2).

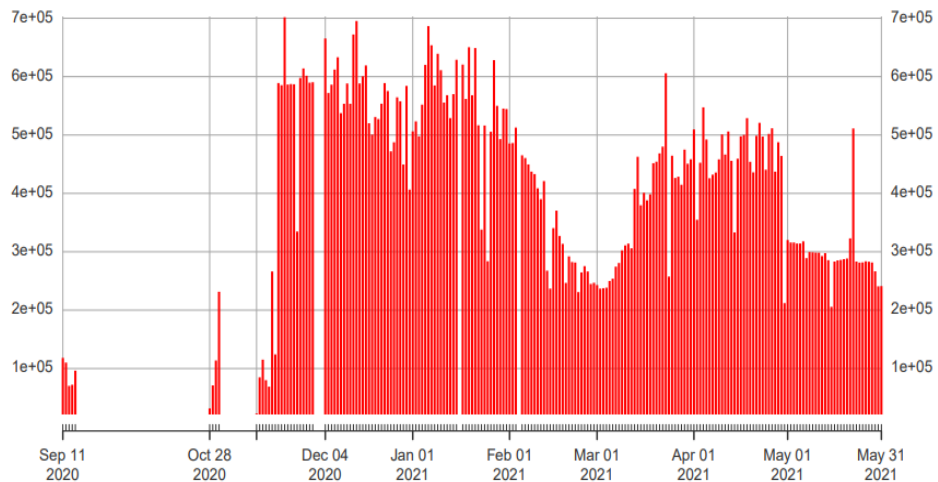


Figure 4.2 Sales of seasoning during the festive span in China

Results revealed that the majority of sales came during the first two events spanning December to January, followed by a decrease in sales of almost 39%. Later it increased till the end of April which spanned the Holy Month of Ramadan. This fluctuation is due to the fasting hours of the Muslim community but still provides a decent sales pattern because of home cooking to release the fast (Figure 4.3).

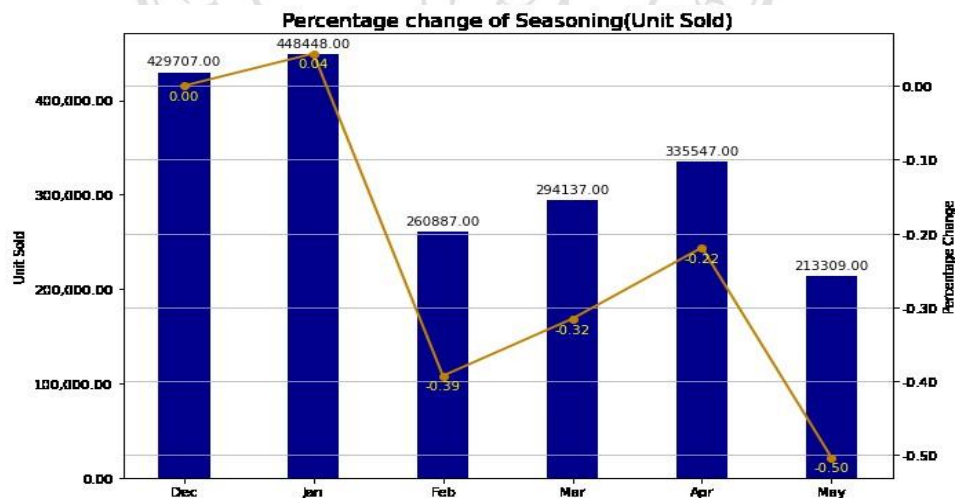


Figure 4.3 Percentage sales of units of seasoning in the festive span

Chicken is another key contributor and one of the best raw ingredients for Halal food (Figure 4.4). Looking at the data set, the sales of chicken touched the horizons during the month of April or the Ramadan period (Pakiding, 2024).

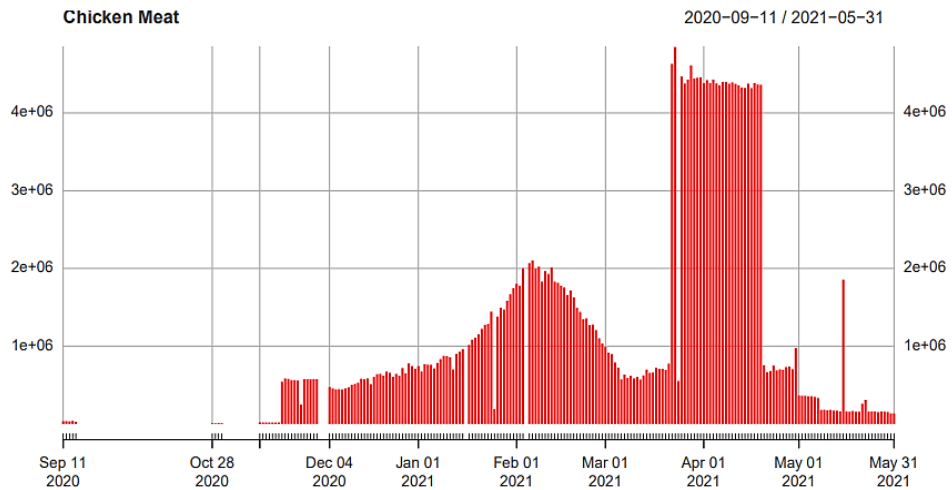


Figure 4.4 Sales of Chicken Meat during the festive period in China

This is again due to the fasting month because huge gatherings have been observed in Mosques to release the fasts. Results demonstrate the importance of chicken meat in every food (Figure 4.5).

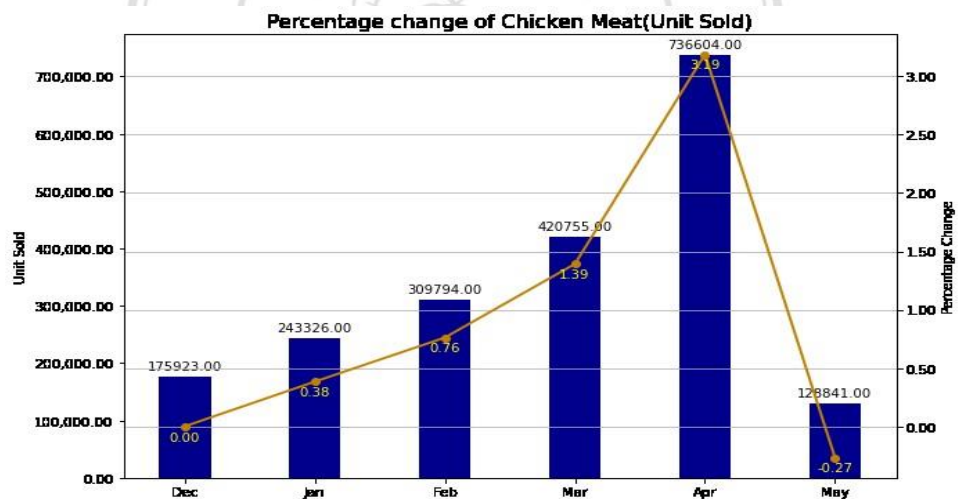


Figure 4.5 Percentage sales of units of raw chicken meat in the festive span

Unlikely, beef meat has not gotten the high sales values as compared to chicken. The decrease in sales can be explained by the fact that during the Holy Month of Ramadan, people prefer to eat light proteins such as chicken and fish (Suhartanto et al., 2020) (Figure 4.6).

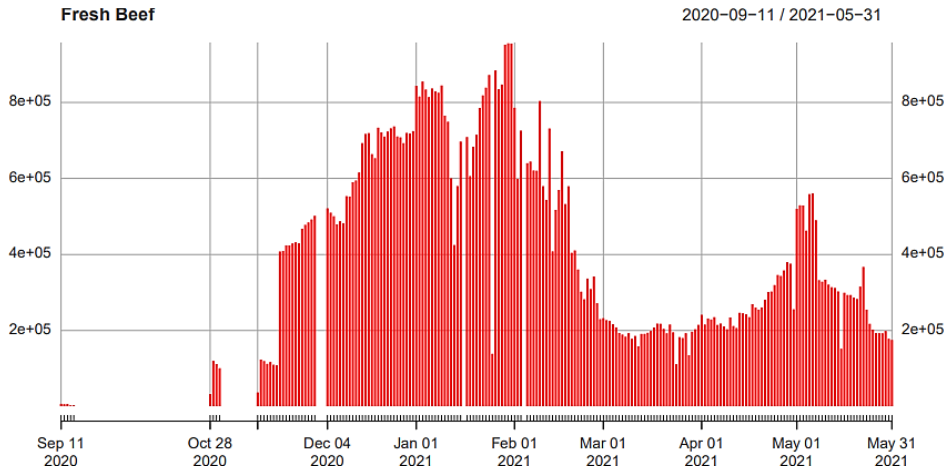


Figure 4.6 Sales of fresh beef during the festive season in China.

While in general during the Chinese New Year festival, the highest sales have been recorded in terms of units sold out (Figure 4.7).

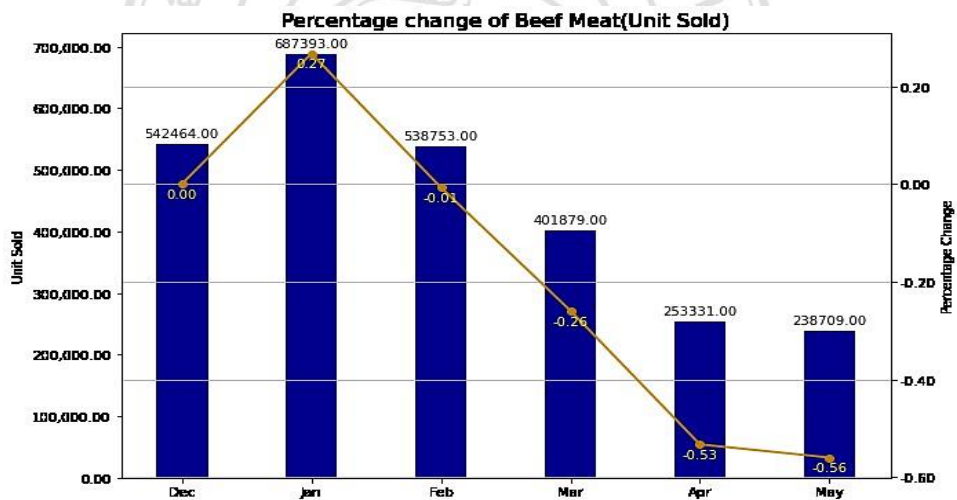


Figure 4.7 Percentage sales of units of raw beef meat in festive span.

Research indicates that processed, fresh, and dried Halal food products command the highest prices and peak consumption during festive seasons like Ramadan and New Year, presenting opportunities for strategic inventory management and investment on Chinese e-commerce platforms (Mukherjee, 2014) (Figure 4.8).

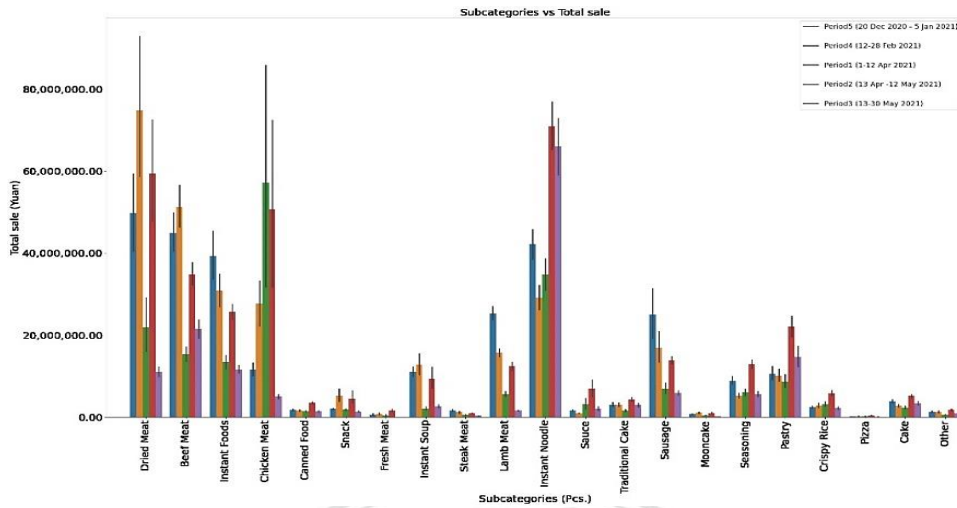


Figure 4.8 Comparison of sales of sub-categories in CNY during the festive span.

Ramadan, Chinese New Year, and International New Year drive the highest Halal food sales, necessitating tailored product customization for Chinese Muslim online customers to ensure timely, season-specific, and localized offerings in a data-driven marketing strategy. (Waheed et al., 2017). This customer-centric approach, grounded in data-driven insights, will serve as the cornerstone for strategic development by adhering to the STP (Segmentation, Targeting, Positioning) model of marketing (Figure 4.9).

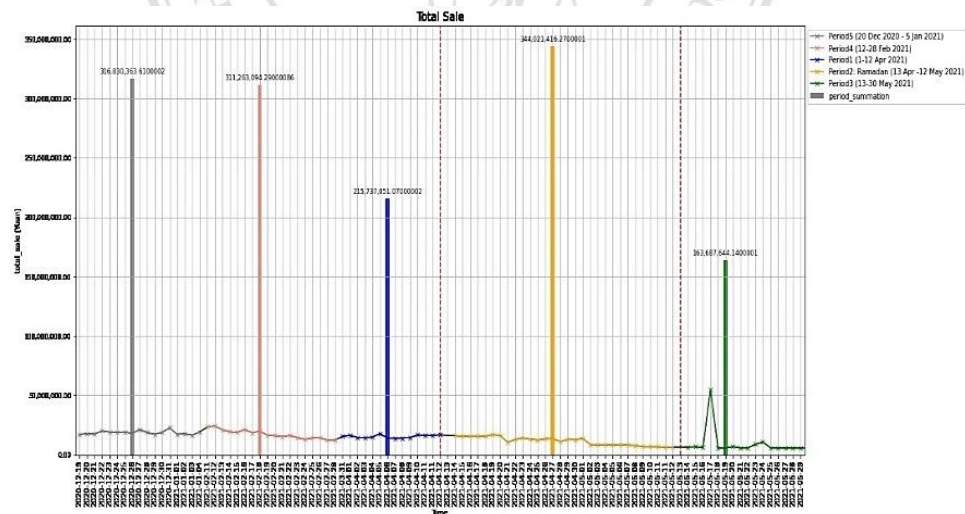


Figure 4.9 Comparison and contribution of festive span in total sales of Halal food.

The findings (Figure 4.10) indicate that during Ramadan, Halal product total sales close-up peak in the pre-Ramadan period, before the month begins, but a notable decline in daily sales during Ramadan itself has been recorded.

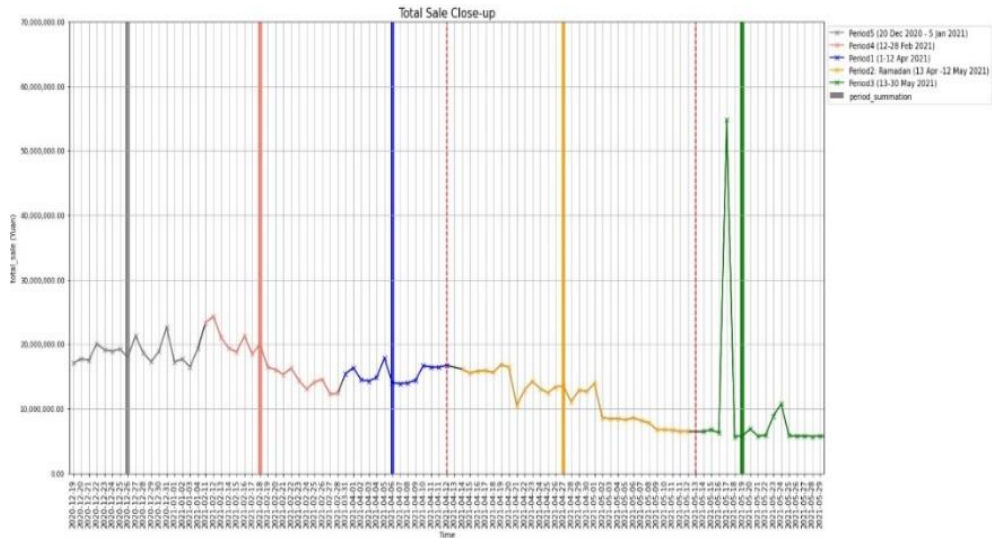


Figure 4. 10 Comparison of pre-Ramadan and post-Ramadan sales close-up with other festivals.

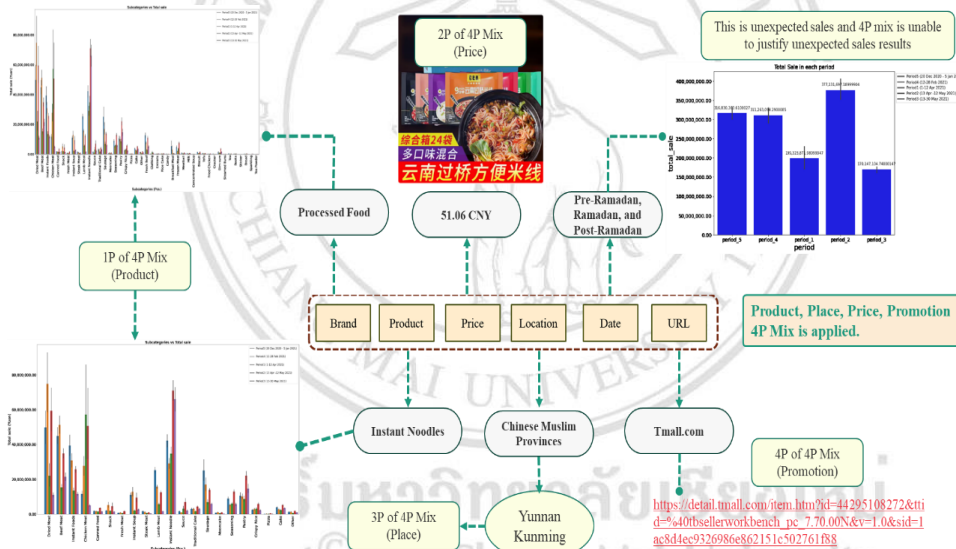


Figure 4.11 Limitation of 4P marketing mix

Predictive analytics using K-means clustering and LSTM models forecast future Halal food sales trends from 2024 to 2030, providing insights into "Total Sales Per Unit" across three market clusters.

4.1.1 Market Segmentation and Sales Analysis

In our predictive analytics framework, the clusters identified as Cluster 0, Cluster 2, and Cluster 1 represent different market segments characterized by unique buying behaviors, price sensitivity, or product preference patterns (Table 4.1). These

clusters are not merely representative of individual products but rather groups of products or consumers that exhibit similar attributes or behaviors. (Janićijević et al., 2020)

Table 4.1 Annual Predicted Sales Per Unit for Clusters 0, 2, and 1 from 2024 to 2030

Year	Cluster 2 (Million Yuan)	Cluster 1 (Million Yuan)	Cluster 0 (Million Yuan)
2024	3,200,000	250,000	100,000
2025	2,650,000	255,000	100,000
2026	2,490,000	260,000	100,000
2027	2,480,000	261,000	100,000
2028	2,475,000	261,000	100,000
2029	2,470,000	261,000	100,000
2030	2,469,500	261,000	100,000

4.1.2 Clusters in Predictive Modelling and Sales Analysis

The K-means algorithm has proven a useful tool to identify homogeneous groups within our consumer database and is well-reported by (Ogunleye et al., 2023). Partitioning a dataset into clusters based on similarities enables personalized marketing, with the algorithm iteratively updating centroids to minimize the sum of squared distances, optimizing clustering accuracy.

4.1.2.1 Visual Representation of Results:

The accompanying figure (Figure 4.12) visually depicts sales trajectories for each cluster over the forecast period, using distinct colors to highlight varying sales volumes, with data scaled using Min-Max scaling for uniformity and accuracy in the K-means model.

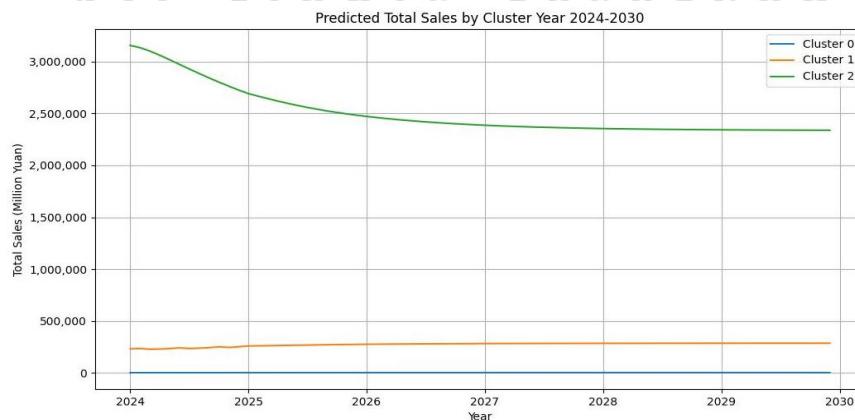


Figure 4. 12 Annual sales forecasts for three market clusters from 2024 to 2030, differentiated by colour: Cluster 0 (blue), Cluster 2 (green), and Cluster 1 (orange).

4.1.3 Contextual Analysis of Sales Data.

We collected and processed both primary and secondary data, encompassing qualitative inputs from online platforms and structured interviews, as well as market reports on trends, consumer behavior, and economic indicators related to the Chinese market for Halal products. The table 4.2 presents processed data for contextual analysis, emphasizing sales revenue generated through keywords and key count analysis across various food and beverage categories. The "Processed Foods" category leads with the highest number of records (350,000), unique items (6,693), amount sold (25,975,932 units), and revenue (1,326,460,780 Yuan), with an average price of 56.78 Yuan. Categories like "Fresh Food" and "Snack" also show significant sales and revenue. The analysis highlights that "Drinking Water" has the highest average price per unit (229.66 Yuan), indicating premium pricing. The table underscores the diverse revenue contributions across different food and beverage categories, reflecting consumer interest and market trends derived from contextual analysis data.

Table 4.2 Processed Data of Categories and Their Number Counts

Category	No. Of Records	Unique Items	Amount Sold	Revenue	Average Price	Weighted Average Price
Processed Foods	350,000.00	6,693.00	25,975,932.00	1,326,460,779.53	56.78	51.06
Snack	161,000.00	4,100.00	8,479,846.00	335,360,956.48	44.88	39.55
Fresh Food	140,200.00	2,500.00	6,909,432.00	953,853,849.27	155.39	138.05
Seasoning	65,000.00	1,300.00	2,670,197.00	108,806,185.60	49.14	40.75
Dried Food	51,000.00	1,200.00	3,206,004.00	590,245,536.56	125.96	184.11
Other	27,000.00	400.00	372,636.00	18,719,282.81	105.01	50.23
Green Tea	20,000.00	4,300.00	1,915,992.00	130,689,673.23	90.17	68.21
Fruit Juice	20,000.00	4,150.00	786,308.00	89,237,114.74	135.47	113.49
Soda	20,000.00	3,200.00	874,772.00	52,173,792.17	79.18	59.64
Energy Drinks	17,000.00	2,500.00	1,567,351.00	143,518,539.12	126.87	91.57
Drinking Water	15,000.00	3,400.00	2,717,159.00	283,032,043.02	229.66	104.16
Beverages	10,000.00	3,500.00	1,152,329.00	145,527,408.18	129.67	126.29
Milk	8,000.00	100.00	127,824.00	5,042,143.21	49.39	39.45
Tea	8,000.00	100.00	86,971.00	3,084,849.76	39.89	35.47
Sparkling	0.00	0.00	2,511.00	329,999.00	106.03	131.42
Tea Powder	0.00	0.00	2,949.00	118,813.15	38.17	40.29

The bubble chart (Figure 4.13) visually represents the relationship between price, amount sold, and revenue for various categories. "Processed Foods" and "Fresh Food" stand out with the highest sales and revenue, reinforcing the (Table 4.2) data that these categories lead in consumer interest. High average prices like "Drinking Water" are reflected in smaller sales volumes but substantial revenue, indicating premium pricing effects. This aligns with the keyword analysis, highlighting the impact of consumer preferences and market trends on revenue generation.

Comparison between Price (circle size), Amount Sold (x) and Revenue (y)

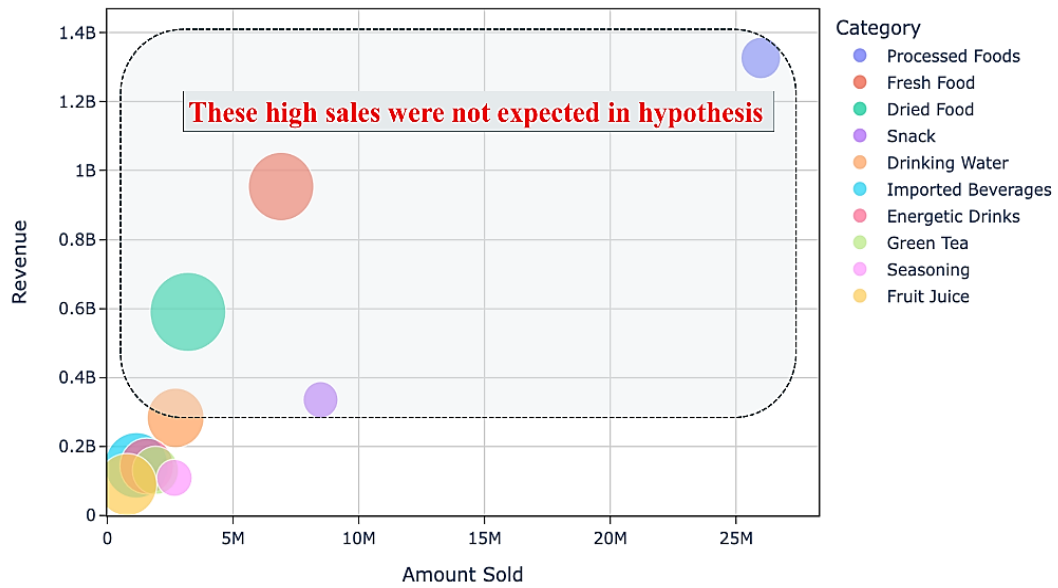


Figure 4.13 Relationship between price, amount sold, and revenue for various categories.

Figures 4.14a-c highlight the prominence of keywords like "Halal," "snack," and "noodle," indicating high consumer interest and potential market drivers in both English and Chinese analyses. The bubble chart 4.13d and keyword counts show that categories such as "Processed Foods," "Fresh Food," and "Instant Noodles" generate significant revenue and sales volume which are totally unexpected than hypothesis, aligning with the previously discussed data. The emphasis on keywords related to convenience and specialty items suggests that consumer preferences for these products are strong, driving the substantial sales and revenue observed in the tabulated data. This underscores the importance of targeting popular keywords in e-commerce strategies to optimize revenue generation.

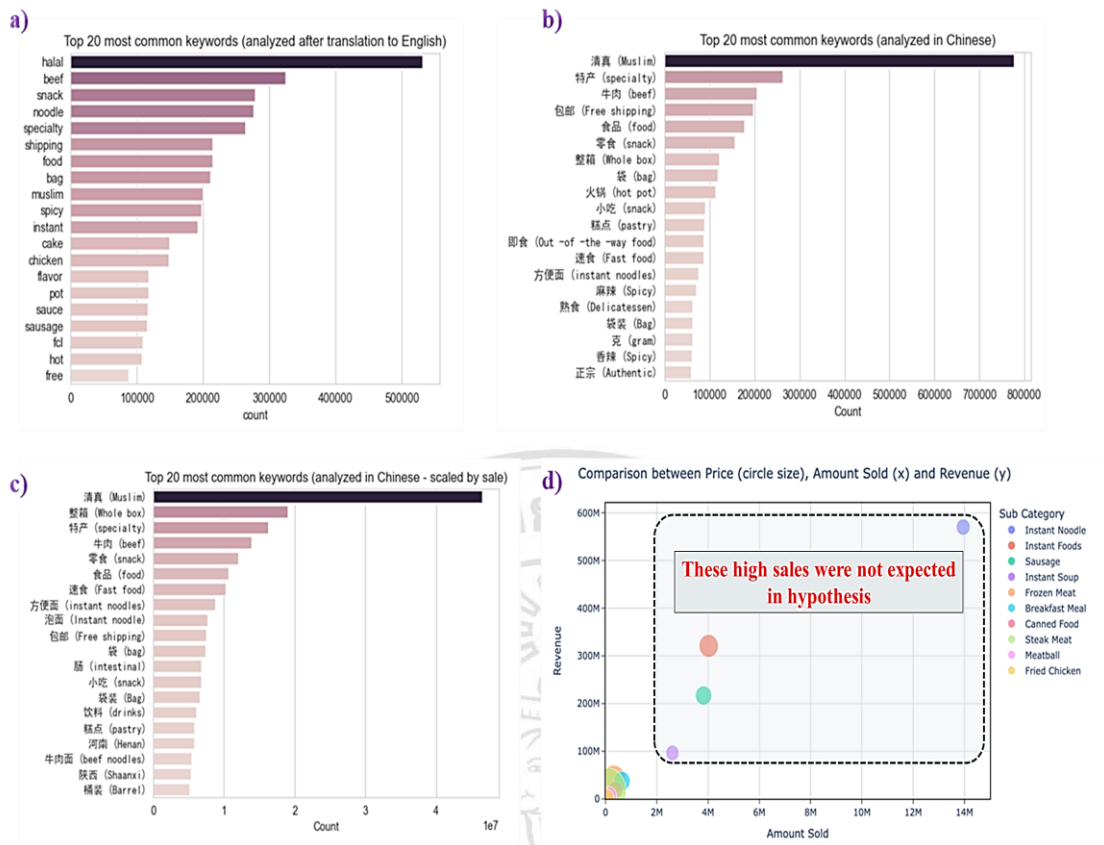


Figure 4.14 a), Keywords analysis for word count in English., b), Top 20 common keywords in Chinese and their word count contribution., c), Top 20 most common keywords and their contribution in sales (Yuan)., d), Relationship between price, unit sold, and revenue generated.

The graph (Figure 4.15) shows a comparative analysis of product count and comments count using keywords, with "Instant Noodles" leading both metrics significantly. This aligns with the earlier data highlighting the popularity of convenience foods like instant noodles and their substantial impact on sales revenue. Categories such as "Instant Food" and "Instant Soup" also show high product counts and comments, indicating strong consumer engagement and demand. The correlation between high product counts, comments, and keyword prominence suggests that consumer sentiment and demand are closely tied to these popular keywords. This reinforces the importance of focusing on highly discussed and sought-after products to capitalize on consumer behaviour and maximize revenue.

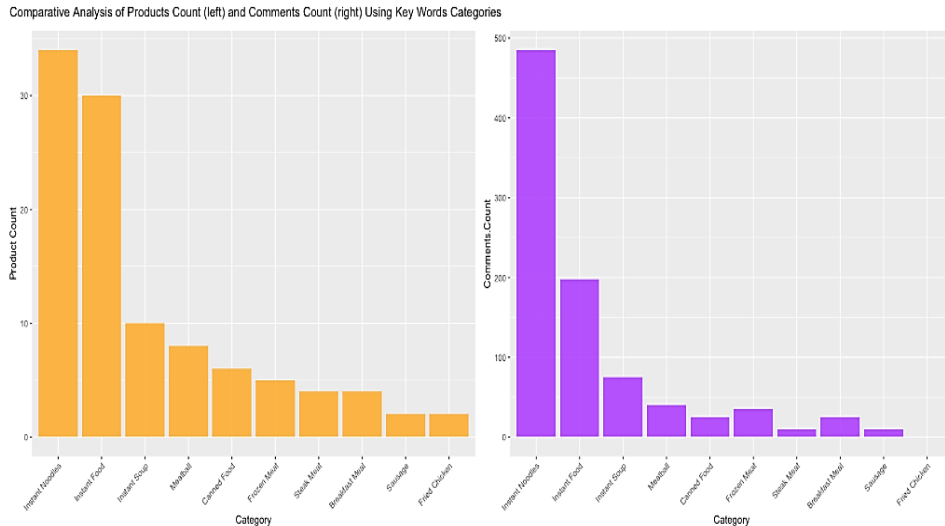


Figure 4.15 Relationship between products counts and comments counts for various categories.

4.2 Predictive Analysis of Halal Food Sales

Predictive analytics utilizing Python libraries such as scikit-learn and TensorFlow enhances forecasting models by leveraging historical data to predict future Halal food purchase trends during Ramadan. Sequential analysis algorithms further refine these models in real-time, facilitating proactive adjustments in inventory and supply chain management to boost profitability.

4.2.1 LSTM/Sequential Analysis.

After clustering, we used an LSTM/sequential model to predict total Halal food sales in the Chinese market during festive periods, showing a gradual rise until 2027 followed by steady growth until 2030, reflecting positive consumer behaviours trends (Figure 4.16, (Bogere, 2023)).

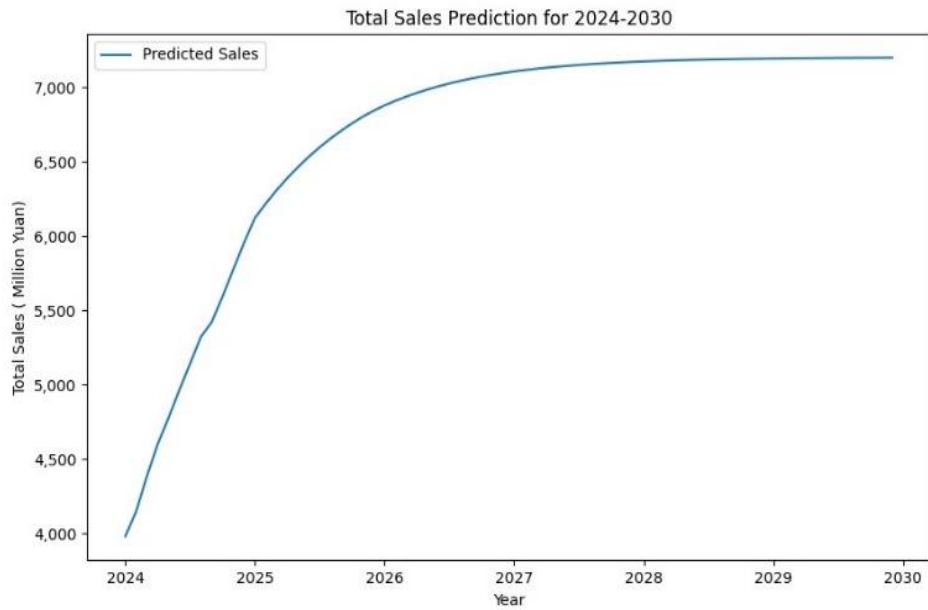


Figure 4.16 Overall sales forecast by LSTM/Sequential Model

The analysis shows significant export potential for Thai Halal food products, with Figure 4.17 indicating festive periods as ideal for sampling and forecasting sales growth, using the STP model for targeted marketing and assured investments. (Raval et al., 2023).

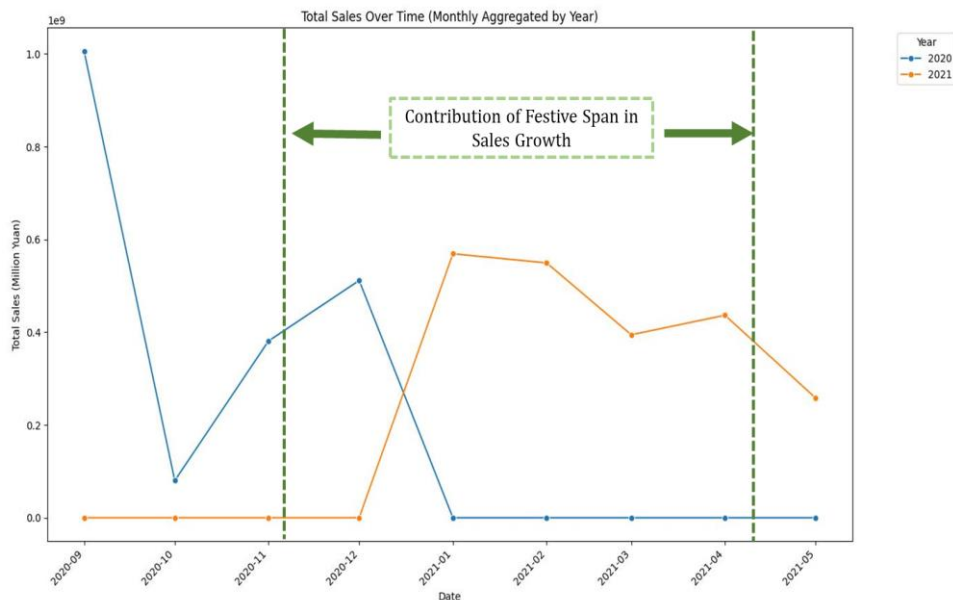


Figure 4.17 Contribution of the festive period to the growth of sales of Hala food in China

4.3 Contextual Analysis of Halal Food Using Consumer's Sentiments to Predict the Revenue and Product.

The optimization results (Table 4.3) of three models BiLSTM, XGBoost, and GBR were used for the selection of best-fit model to give predictive analysis based on consumer sentiments. BiLSTM shows the lowest validation loss (0.010) and percent loss of trait (1.0%) with only 8 epochs, indicating high efficiency in training and validation. XGBoost, while having a higher validation loss (0.045) and percent loss of trait (4.5%), is also optimized for a higher number of epochs (100), making it robust for complex predictions. GBR shows moderate validation loss (0.025) and percent loss of trait (2.5%), balancing efficiency and robustness. Considering these results, BiLSTM is best for quick, efficient predictions, while XGBoost and GBR, with their higher epochs, are suitable for more detailed and comprehensive sales and product predictive analysis (Ramadhan & Putrada, 2023).

Table 4.3 Optimization of Algorithms for Predictive Analysis Using Sentiments of Consumer

Model	Epoch Number	Trait Checked	Trait Loss	Percent Loss of Trait	Percent Accuracy
BiLSTM	8	Training Loss	0.016	1.6%	98.4%
		Validation Loss	0.010	1.0%	99.0%
XGBoost	100	Training Loss	0.12	12%	88.0%
		Validation Loss	0.045	4.5%	95.5%
GBR	100	Training Loss	0.016	1.6%	98.4%
		Validation Loss	0.025	2.5%	97.5%

The actual revenue with predictions from XGBoost and Gradient Boosting models have been compared (Figure 4.18). Gradient Boosting exhibits a lower RMSE (9876.73) compared to XGBoost (10530.22), indicating better accuracy in predicting revenue. Both models capture the revenue trends, particularly for high-demand products like "Instant Noodles" and "Instant Soup," reflecting the strong consumer interest and demand identified in previous keyword and sentiment analyses (Ramadhan & Putrada, 2023). This consistency confirms that consumer sentiment and keyword frequency effectively predict sales trends and revenue, validating the use of these models for accurate sales forecasting based on consumer behavior insights.

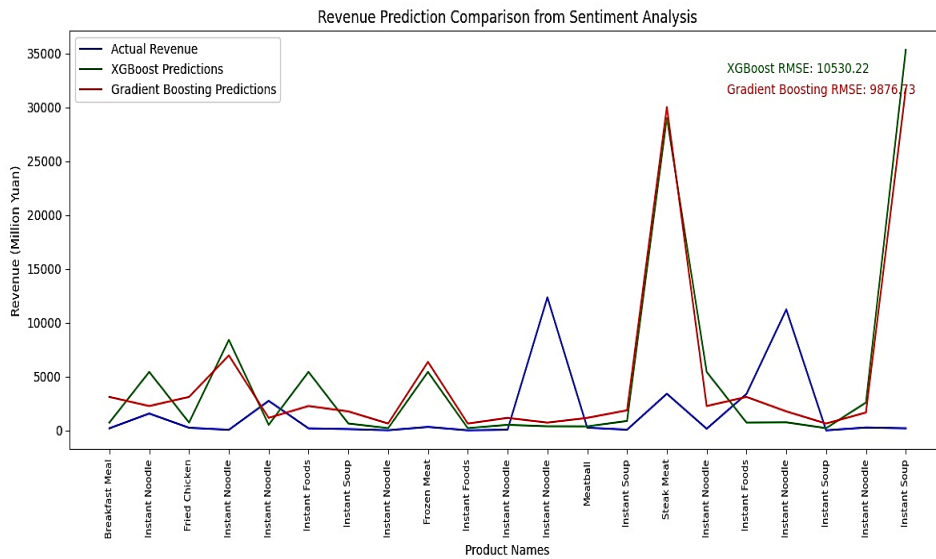


Figure 4.18 Prediction of best-selling products based on consumer sentiment analysis.

The revenue predictions from sentiment analysis for 2024 to 2030 using GBR (Gradient Boosting) and XGB (XGBoost) models were also made and depicted below (Figure 4.19). Both models align closely with actual revenue trends, with GBR showing slightly better accuracy (RMSE of 9,876.73) compared to XGB (RMSE of 10,530.22). The predictions indicate a steady revenue increase for popular products like "Instant Noodles" and "Instant Soup," reflecting consistent consumer demand. Spikes in revenue predictions align with historical trends, suggesting potential periods of high sales, possibly due to seasonal demand or marketing efforts. The models' projections show stabilization towards the end of the period, indicating maturity in market demand (Shang & Hamori, 2023). Overall, these predictive insights can guide strategic business decisions, inventory planning, and marketing strategies to capitalize on anticipated consumer behavior trends through 2030.

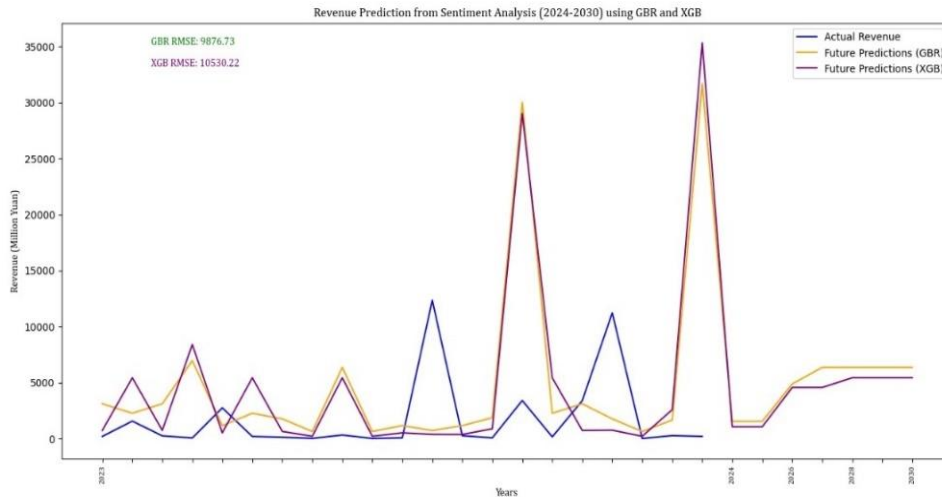


Figure 4.19 Prediction of sales projection by using sentiment analysis year 2023-2030

4.4 Agile Marketing Strategy and Sentiment Analysis of Thai Food Products

To develop the appropriate agility in the marketing, we need to consider the consumer's comments to identify the problem and to give a briefed insight to construct the context of the market. Hence, a brief analysis of Thai consumers' sentiments for Thai products was done. Initially, the keywords analysis of Chinese consumers indicates the high demand for "Halal" in food products (Figure 4.13a). However, after the sentiment analysis of Halal food and beverages of Thai products, we interestingly find that Thai sentiments are linked with taste and ingredients instead of Halal logo with Halal branding (Table 4.4). These results identify the problem by following the first P of the new 8P marketing strategy.

Table 4.4 Sentiment analysis of top 30 big Thai-food products

Comments	Sentiment	Category
['Good taste', 'Very good, as always']	0.7264	positive
['Satisfied with repurchase', 'The express del...']	0.9971	positive
['It tastes very good. I got two pieces of dri...']	0.9978	positive
['Not bad. I bought this brand when I went to ...']	0.8248	positive

CHAPTER 5

DISCUSSION

The analysis of this dissertation focuses on the festive period, particularly Eid-ul-Fitr, and its impact on the sales of Halal food products in the Chinese market such as Tom Yum Noodles. The expected outcome was an increase in sales during the festive period, which was observed. Our results highlight that the boost in sales of processed foods, including Tom Yum Noodles, aligns with the anticipated surge due to the festive demand. This alignment suggests that consumer behavior patterns were accurately predicted and capitalized upon, confirming the validity of the predictive models used.

5.1 Limitations of Work

Though the data and results depict valuable findings, yet several limitations related to data collection during the COVID-19 pandemic have to be addressed, primarily because the data for sales analysis was gathered using web crawling and web scraping techniques. Key limitations include:

- **Data Accuracy:** Web crawling might miss certain nuances in consumer behavior or misinterpret context, leading to potential inaccuracies.
- **Data Coverage:** There may be gaps in the data due to variations in internet accessibility and usage across different regions.
- **Consumer Behavior Changes:** The pandemic significantly altered consumer behavior, making it challenging to distinguish between temporary shifts and long-term trends.
- **Technological Constraints:** Reliance on automated data collection might overlook qualitative aspects that human data collectors would typically observe.

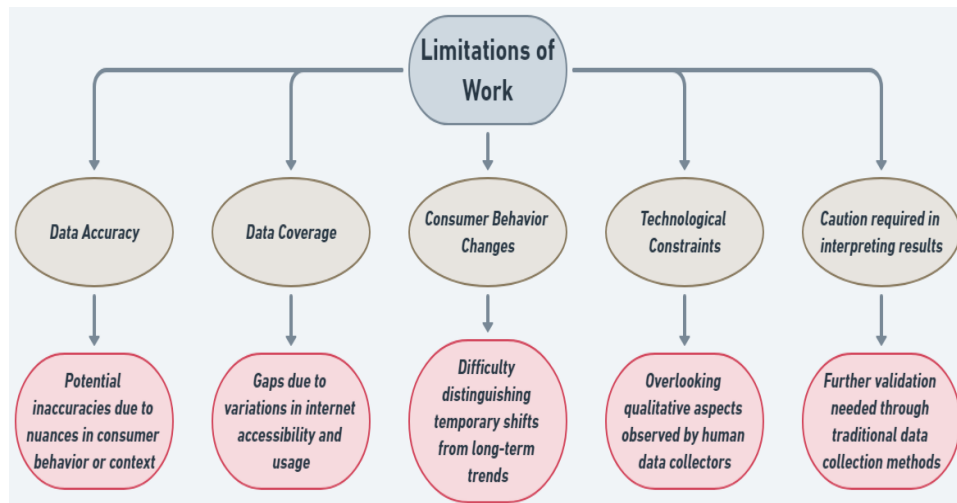


Figure 5.1 Limitations of the reported study

These limitations necessitate caution in interpreting the results and suggest that further validation through more traditional data collection methods might be necessary once conditions normalize.

5.2 Novelty of Work

Our research presents several novel contributions to the field of Halal food marketing and consumer demand prediction:

- **Integration of Predictive and Contextual Analysis:** By combining predictive analytics with contextual analysis, the research provides a comprehensive framework for understanding consumer behavior in the Halal food sector.
- **Agile Marketing Strategies:** The study emphasizes the need for agile marketing strategies that can quickly adapt to changing market conditions and consumer preferences, particularly in the dynamic e-commerce environment.
- **Data-Driven Approach:** The use of advanced machine learning models such as LSTM, BiLSTM, XGBoost, and Gradient Boosting (GBR) to predict consumer demand represents a significant advancement in marketing analytics for the Halal food trade.
- **Focus on Bilateral Trade:** The research specifically targets the Halal food trade between Thailand and China, providing valuable insights into a

relatively underexplored market segment and highlighting the potential for growth in this area.

- **Impact of Cultural and Religious Factors:** The study underscores the importance of cultural and religious factors in shaping consumer demand, which is particularly relevant for marketing Halal products.

These contributions not only enhance the theoretical understanding of consumer demand prediction and agile marketing but also provide practical insights for businesses looking to optimize their marketing strategies in the Halal food sector.

5.3 Findings of the Results

The K-means algorithm identified three consumer groups based on price and sales volume (Table 4.1): Cluster 0 with low price sensitivity or premium product preference indicates that sales to a specific group of communities with high brands and limited promotion policies lead to constant sales with almost no fluctuation. Whereas, cluster 1 with high price sensitivity favoring promotional offers which are time-limited and open to a broader customer range while Cluster 2 with intermediate sensitivity requires nuanced marketing. These clusters, derived from analyzing comprehensive datasets, help tailor marketing and inventory management strategies.

The predicted sales (Figure 4.11) provide crucial insights for strategic planning, resource allocation, and tailored marketing campaigns, helping businesses prepare for demand fluctuations and improve market positioning during key periods like Ramadan. Cluster 0 shows lower, stable sales, Cluster 2 indicates high initial demand and steady sales, and Cluster 1 suggests significant growth, guiding investment and marketing strategies. (John et al., 2023).

The consistent predictions across years highlight the robustness of our predictive models in capturing complex market dynamics, essential for long-term planning and investment in the Halal food industry (Figure 4.15). Our analysis integrates k-means clustering and LSTM/Sequential models to enhance prediction accuracy and market segmentation. K-means clustering categorizes data into distinct groups based on sales data similarities, allowing tailored predictive models for different market segments. The LSTM/Sequential model then models the relationship between sales and influential

factors over time within each cluster, mirroring methodologies like those in (Fauzi et al., 2022) for competitive pricing and demand forecasting.

Our analysis reveals a strong alignment between consumer sentiment, keyword analysis, and actual sales data in the Halal food and beverage sector in China (Table 4.2). The "Processed Foods" and "Fresh Food" categories, featuring high sales volumes, are linked with frequently searched keywords like "Halal," "snack," and "noodle." Sentiment analysis indicates a consumer preference for convenience and specialty items (Figure 4.13 a-c), validated by the success of "Instant Noodles" and "Instant Soup." Predictive models, especially Gradient Boosting (GBR), show high accuracy in revenue forecasts. Projections suggest continuous growth for products like "Instant Noodles" and "Processed Foods," making them ideal for investment. The Thai Halal food industry, particularly Instant Tom Yum Mala Halal noodles, holds significant potential, aligning with consumer trends and boosting Thailand's GDP and global influence.

The data analysis shows a strong alignment between sentiment analysis, keyword frequency, and market trends, crucial for strategic market planning in China. Categories like "Processed Foods" and "Fresh Food" lead in sales and revenue, with "Instant Noodles" and "Instant Soup" being particularly successful. Keyword analysis highlights terms like "Halal," "snack," and "noodle" as dominant in consumer searches (Figure 4.14).

This indicates a strong consumer preference for convenience and specialty foods. Sentiment analysis of reviews and comments further validates "Instant Noodles" as a top category, reflecting high consumer engagement and satisfaction. Predictive models using GBR and XGBoost algorithms closely match actual revenue data, with the GBR model showing superior accuracy, making it vital for strategic planning (Figure 4.17). To capitalize on the emerging opportunities in the global Halal food market and drive Thailand's economic growth, it is recommended to prioritize investment in Instant Tom Yum Mala Halal noodles and other high-demand instant noodle varieties. This strategic focus aligns with consumer preferences, leverages Thailand's culinary strengths, and harnesses the power of digital e-commerce for sustained market expansion (Figure 4.18). By doing so, Thailand can optimize revenue generation, enhance its global soft power, and contribute significantly to its annual GDP growth.

5.4 Unexpected Results; Post-Ramadan Sales Surge

A notable observation is the unexpected sales boost in the seven days following Ramadan, especially in China. This surge can be attributed to the cultural and religious significance of Eid al-Fitr, which marks the end of Ramadan. During Eid al-Fitr, there is an increased demand for festive foods and celebratory meals, leading to a spike in sales of Halal products. Interestingly, an unexpected surge in sales immediately following the Eid-ul-Fitr festival has been observed, lasting for about seven days (Figure 4.16). This post-festival boost was not initially anticipated but was observed across various e-commerce platforms. This phenomenon could be attributed to several factors:

5.4.1 Promotional Strategies During Eid al-Fitr

Effective promotional strategies during Eid al-Fitr include:

- **Targeted Promotions:** Tailored promotions that cater to the festive needs and preferences of the Muslim community.
- **Limited-Time Offers:** Special discounts and offers during the festive period to encourage bulk purchases.
- **Cultural Relevance:** Marketing campaigns that resonate with the cultural and religious significance of the festival.

These strategies capitalize on the increased consumer spending during Eid al-Fitr, leading to higher sales volumes. These unexpected sales can also be justified through contextual analysis and key words analysis results (Table 5.1). These results are strongly aligned with the perfectly planned agile marketing strategy which has been backed up by contextual analysis.

Table 5.1 Most mentioned keywords analysed by contextual analysis of Chinese consumers.

Word	Frequency	Word	Frequency	Word	Frequency	Word	Frequency	Word	Frequency
Halal	530803	meat	82826	henan	49163	sheep	36109	face	26705
beef	324622	fresh	77870	spiced	46735	bulk	36072	bean	26251
snack	278630	cooked	73724	material	46482	mongolia	35327	intestinal	26155
noodle	276034	soup	72376	vacuum	46200	ready	35277	convenient	26027
specialty	263957	authentic	70560	dry	45525	fried	34908	crisp	25679
shipping	214840	islamic	68495	rice	44844	frozen	33824	juice	25620
food	214290	powder	64521	package	44667	xi'an	33295	sweet	25457
bag	210657	tea	64520	yunnan	44123	hui	32571	tendon	24887
muslim	199543	eat	61746	taste	43829	vegetarian	32171	home	24450
spicy	197485	pastry	60888	ningxia	43049	braised	31802	fruit	24153
instant	192079	red	58932	barrel	42415	oil	31464	green	23995
cake	148876	gift	57898	500g	42165	shredded	31396	yi	23813
chicken	148178	old	56229	jerky	40998	pepper	31046	crispy	23667
flavor	118133	breakfast	53932	inner	40847	dried	30629	qing	23249
pot	117241	box	53632	drink	40780	new	30049	bread	22602
sauce	116017	small	52320	pound	39501	mutton	29164	surface	22289
sausage	115729	traditional	52053	sour	38628	pack	29043	leg	20995
fcl	108445	seasoning	51822	shaanxi	38427	sesame	28427	cattle	20787
hot	108045	g	51439	barbecue	38127	lo	27938	large	20761
free	87632	lamb	50717	bottle	37210	handmade	27739	yang	20679

The numbers mentioned in Table 5.1 shows that how the contextual marketing works in Chinese markets. The high sales and positive number for sentiment score can also be evidence for this increase in high sales and an appropriate justification for unexpected results (Figure 5.2).

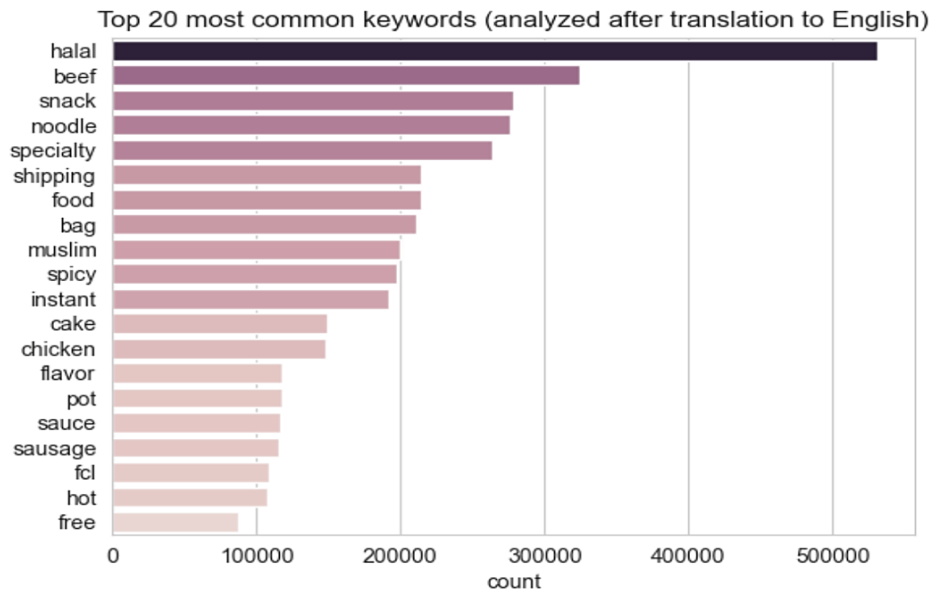


Figure 5.2 Top 20 most commonly searched keywords in Chinese food market

Contrary, in Thailand when the sentiments were analysed, we got many positive score, but the contextual analysis revealed that “Halal” is not that popular word in Thailand to sell Thai brands in Thailand as Halal food (Figure 5.3).

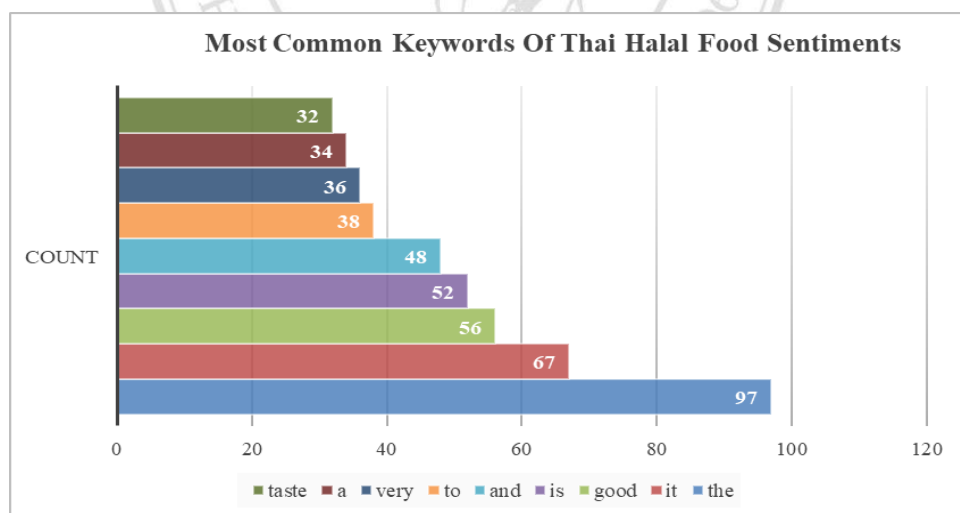


Figure 5.3 The most common keywords in Thai Halal food sentiment analysis

It means that consumer in China is most concerned about Halal certification which is branded on all Chinese Halal food products. On the other hand, Thai consumer can look for the ingredients if its edible or not. But the best approach would be the incorporation of Thai Halal logo with the Logo of Chinese Halal food, will bring up more satisfaction to the consumers in Chinese market (Figure 5.4).



Figure 5.4 Thai-Chinese Halal food logo for the satisfactory sentiment of Chinese consumer

Overall, we emphasize the importance of leveraging contextual analysis and machine learning models to enhance marketing strategies for the Halal food trade between Thailand and China. The research highlights how integrating predictive analytics and contextual insights can significantly impact business decisions and market outcomes. By using models such as LSTM, BiLSTM, XGBoost, and Gradient Boosting Regression (GBR), the study demonstrates the capability of these advanced tools to predict consumer demand and understand market trends accurately.

The dissertation successfully illustrates that an 8P marketing policy can be effectively designed by integrating the 4A (Anytime, Anywhere, Anyhow, Anyone) and 4P (Product, Price, Place, Promotion) marketing strategies. The integration results in a comprehensive approach that addresses both the logistical and promotional aspects of marketing, ensuring that products are available to consumers whenever and wherever they need them, and through any preferred channel (Figure 5.5). The need for a Halal logo coincides with the 1st P of the strategy followed by the data-driven strategies and based on the contextual framework of the market other Ps are the best suited to mitigate the problem of promotion, place, price, product, packaging (with Halal logo), people of both Muslim and non-Muslim communities in China, and provides the precise process of food from raw to eat all in a stream of Halal proceedings.

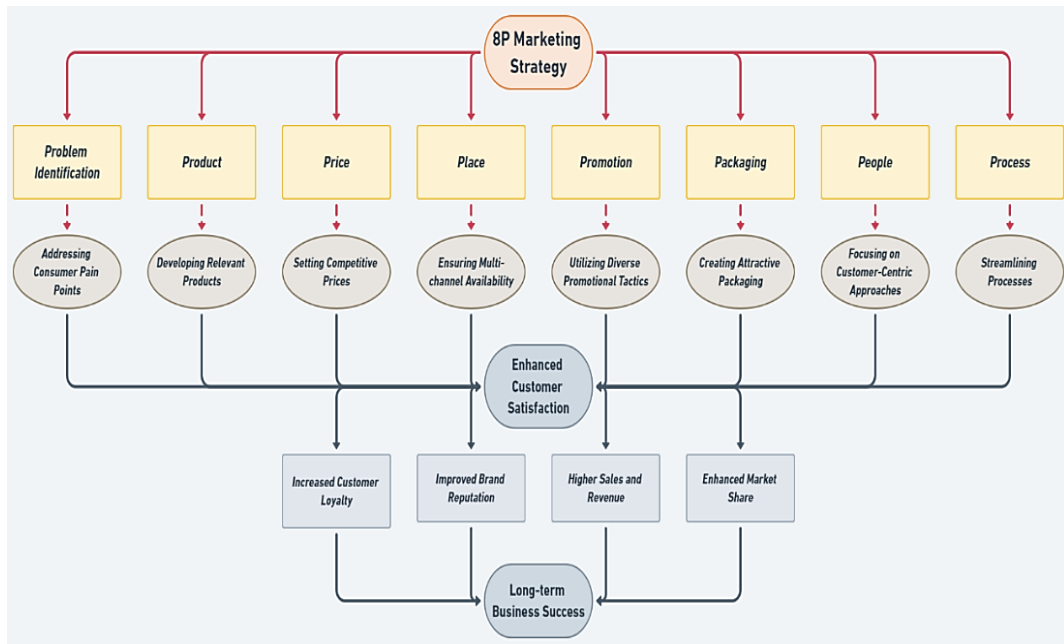


Figure 5.5 Prediction Model of 8P marketing strategy for a sustainable business



CHAPTER 6

CONCLUSIONS

This study highlights the significance of festive periods in addressing the Halal food gap in China, emphasizing a customer-centric approach to target the growing Muslim community. This approach supports the Chinese government's efforts to meet Halal food demand, revealing that both ingredients and ready-to-serve foods significantly impact China's GDP growth. The festive span (December to May) is optimal for targeting the Chinese market through e-commerce, especially in conjunction with BRI and Silk Road initiatives. Data crawling and time series analysis have provided insights into seasonal spending patterns, essential for managing large datasets and facilitating sales predictions. The study underscores the value of data-driven marketing strategies for navigating the competitive Chinese market. Additionally, leveraging social media and sentiment analysis can offer insights into customer perceptions, helping businesses understand sentiment, identify improvement areas, and respond to trends in real-time. Despite challenges like data volume and sentiment interpretation, advanced tools in machine learning and natural language processing can enhance decision-making for Halal food products.

6.1 Agile Marketing Strategy and the 8P Marketing Model.

The integration of Agile marketing strategies with the 4A principles (Anywhere, Anytime, Anyone, Anyhow) has proven to be highly effective in the dynamic marketplace. The analysis indicates that leveraging the 4A principles can significantly enhance marketing efficacy by ensuring comprehensive reach and engagement.

- a) **Anywhere (Everywhere by 5G):** The deployment of 5G technology facilitates seamless connectivity, enabling businesses to reach customers ubiquitously. This constant presence is crucial for capturing market share and driving sales.

- b) **Anytime (24/7 Availability):** The ability to offer products and services around the clock meets the growing consumer demand for convenience. This is especially relevant in today's fast-paced world, where consumers expect immediate access to products and services.
- c) **Anyone (Every Customer Segment):** Targeting diverse customer segments ensures that marketing efforts are inclusive and expansive. This broad approach helps in capturing a wide array of consumer preferences and behaviours.
- d) **Anyhow (Online to Offline Integration):** The integration of online and offline channels provides a cohesive customer experience across all touchpoints. This omnichannel strategy enhances customer satisfaction and loyalty.

6.1.1 Comparative Analysis of Marketing Strategies: 4P and 4A

In recent years, the global Halal food market has experienced substantial growth, driven by increasing Muslim populations and rising demand for Halal-certified products. This study explores the integration of Agile marketing strategies focusing on the 4A principles (Anywhere, Anytime, Anyone, Anyhow) with traditional 4P marketing (Product, Price, Place, Promotion) to form a comprehensive 8P marketing model. This integrated approach is particularly relevant in enhancing the Halal food trade between Thailand and China via e-commerce platforms. While traditional 4P marketing (Product, Price, Place, Promotion) remains relevant, the integration of 4A principles with 4P marketing forms the basis of the new 8P marketing strategy. This hybrid approach leverages the strengths of both models to offer a comprehensive marketing framework that is both agile and effective. The integration of the 4A elements ensures that the marketing strategy is not only product-focused but also highly responsive to consumer behaviours and preferences. The use of advanced technologies like 5G facilitates real-time interactions and transactions, making it easier to launch new products quickly and gather immediate feedback for continuous improvement. The sales data presented in Chapter 4 results demonstrates a clear connection with the 4P marketing mix (Product, Price, Place, Promotion). The analysis of Halal food purchasing patterns during festive periods such as Ramadan and Chinese New Year indicates significant fluctuations in sales, which align with the strategic implementation of the 4Ps.

- **Product:** The focus on essential Halal ingredients like seasoning, chicken, and beef, and their sales trends during festivals reflect the

importance of offering relevant products that meet consumer demand. The preference for ready-to-eat formats and light proteins during Ramadan highlights the need for product customization based on cultural and religious practices.

- **Price:** The variations in sales data during different festive periods also underline the importance of strategic pricing. The high sales of processed and fresh Halal food products during peak seasons suggest that consumers are willing to spend more during these times, indicating the effectiveness of value-based pricing strategies.
- **Place:** The use of e-commerce platforms like Taobao.com and Tmall.com to analyse sales data showcases the significance of place in the 4P mix. Ensuring product availability on popular online platforms meets the consumer's need for convenience and accessibility, crucial for capturing the growing online market in China.
- **Promotion:** The observed sales peaks during major festivals highlight the role of promotion. Targeted marketing campaigns and promotional offers during these times can drive higher sales, as seen in the increased demand for Halal products during Ramadan and Chinese New Year.

6.1.2 Linking Sentiment Analysis with the 4A Marketing Framework

The sentiment analysis results provide insights into consumer preferences and behaviors that align with the 4A marketing framework (Anywhere, Anytime, Anyone, Anyhow).

- **Anywhere:** The influence of 5G technology, as part of the 4A framework, ensures that marketing efforts can reach consumers ubiquitously. The positive sentiment around convenience foods and ready-to-eat products indicates that consumers appreciate the ability to purchase from anywhere, facilitated by seamless connectivity.
- **Anytime:** The 24/7 availability of products meets the 'Anytime' principle. The data shows that consumers are consistently

purchasing Halal food products, especially during festive periods, underscoring the importance of round-the-clock accessibility to always cater to consumer needs.

- **Anyone:** Targeting every customer segment is essential, as reflected in the varied preferences for different Halal products. The sentiment analysis highlights the diverse interests of consumers, from processed foods to fresh ingredients, indicating the need to cater to a broad customer base.
- **Anyhow:** The integration of online and offline channels to create a cohesive customer experience is crucial. The analysis shows strong consumer engagement with both digital and physical touchpoints, suggesting that a holistic marketing approach that combines these channels effectively meets consumer expectations.

6.2 Aligning Results with Agile Marketing and the 8P Framework

This study emphasizes the effectiveness of Agile marketing strategies in constructing the 8P marketing model (Product, Price, Place, Promotion, Packaging, People, Process, and Problem Identification). The alignment of the results with Agile marketing principles is evident through the following

- **Speed and Agility:** The use of predictive analytics and real-time data to forecast sales trends and consumer sentiment demonstrates the agility in adapting to market changes quickly. This approach allows for timely adjustments in inventory and marketing strategies.
- **Comprehensive Reach:** The integration of 4P and 4A principles ensures that marketing efforts cover all aspects of consumer engagement, from product development to promotional tactics, thereby achieving comprehensive reach across diverse customer segments.
- **Enhanced Customer Experience:** By leveraging insights from sentiment analysis and consumer behavior, businesses can create a seamless and engaging customer journey across all touchpoints, enhancing overall satisfaction and loyalty.

- **Data-Driven Decisions:** Utilizing advanced analytics and machine learning models for predictive insights enables data-driven decision-making, optimizing marketing efforts and improving overall performance.

6.3 Integration of 4P with 4A: The 8P Marketing Strategy

Combining the traditional 4P marketing mix (Product, Price, Place, Promotion) with the 4A principles results in a robust 8P marketing strategy. This new model leverages the strengths of both approaches to create a comprehensive and dynamic marketing framework. The 8P strategy includes:

1. **Problem Identification:** Recognizing and addressing consumer pain points ensures that products and services are relevant and valuable to the target audience.
2. **Product:** Developing high-quality products that meet consumer needs and preferences is fundamental. This involves continuous innovation and improvement based on consumer feedback and market trends.
3. **Price:** Setting competitive and value-based pricing strategies ensures that products are accessible to a broad range of consumers while maintaining profitability.
4. **Place:** Ensuring product availability across multiple channels (both online and offline) guarantees that consumers can access products conveniently.
5. **Promotion:** Utilizing diverse promotional tactics, including digital marketing, influencer partnerships, and traditional advertising, to reach and engage the target audience effectively.
6. **Packaging:** Creating attractive and functional packaging that resonates with consumers and enhances the product's appeal.
7. **People:** Focusing on customer-centric approaches and excellent customer service to build strong relationships and foster loyalty.
8. **Process:** Streamlining processes to enhance efficiency and customer satisfaction, ensuring that the business can adapt quickly to market changes.

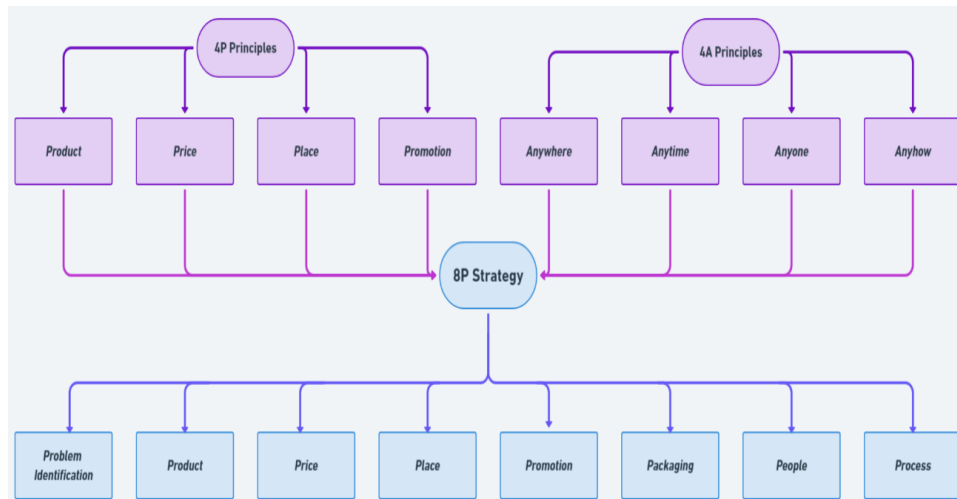


Figure 6.1 Integration of 4A into 4P towards the 8P marketing strategy

6.4 Predictive advantages of the 8P marketing for sustainable business

The integration of 4P and 4A principles into the 8P marketing strategy offers several advantages:

- **Speed and Agility:** The 8P model allows for faster and more convenient product launches, with real-time analysis facilitating quick adjustments based on market feedback.
- **Comprehensive Reach:** By targeting diverse customer segments and ensuring 24/7 availability, businesses can capture a wider audience.
- **Enhanced Customer Experience:** The integration of online and offline channels ensures a seamless and engaging customer journey, fostering higher satisfaction and loyalty.
- **Data-Driven Decisions:** Utilizing real-time data and predictive analytics allows businesses to make informed decisions, optimizing marketing efforts and improving overall performance.

The global landscape of economic and cultural influence is evolving, driven by faith power, soft power, and digital e-commerce power, forming a new growth platform. This is evident in the potential of Thai Halal food in the Chinese market. Faith power offers a substantial market base, soft power enhances cultural appeal and consumer trust, and digital power ensures efficient market penetration. By leveraging these elements,

Thailand can strategically position its Halal-certified food products for sustained growth. This integrated approach, combining cultural assets, demographic targeting, and advanced digital tools for market analysis, exemplifies a comprehensive strategy for economic development. This multi-faceted platform not only boosts revenue but also strengthens cultural ties and enhances Thailand's global influence. Halal certification enhances the appeal of Thai food to Muslim consumers. Sentiment analysis shows high demand for processed foods, fresh foods, and convenience items, in China, suggesting that Halal-certified Thai food can boost Thailand's cultural and economic influence.

Based on these insights, strategic recommendations for the Chinese market should focus on prioritizing investment in high-demand categories like "Processed Foods," "Fresh Food," "Instant Noodles," and "Instant Soup." Marketing strategies should leverage popular keywords and sentiments to optimize campaigns and target key consumer segments effectively. Additionally, expanding product offerings in areas that align with consumer preferences, such as convenience foods and specialty items, can further enhance market positioning. Utilizing predictive models like GBR for accurate revenue forecasting will aid in informed decision-making, ensuring sustained growth and profitability. By integrating sentiment analysis into market strategies, businesses can better align their products with consumer needs, driving success in the competitive Chinese market.

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CHAPTER 7

FUTURE WORK

This dissertation's findings provide a thorough analysis of consumer demand for Halal food products during the festive period, aligning with the expected results and highlighting unexpected post-festival sales surges. The study's limitations due to COVID-19 data collection methods are acknowledged, emphasizing the need for cautious interpretation of results. The novelty of the work lies in its integration of predictive analytics with contextual analysis, the development of agile marketing strategies, and its specific focus on the Halal food trade between Thailand and China. These insights offer valuable guidance for enhancing marketing strategies and capitalizing on market opportunities in the dynamic Halal food sector. As the Halal food sector is based on the growing population of Muslims worldwide hence will be a new soft power for Thailand which will be called Faith power. The data-driven strategies will strengthen the foundations of digital power on various e-commerce platforms. By all means, the 8P strategy will be the novel policy in the field of market planning and product launch (Figure 7.1).

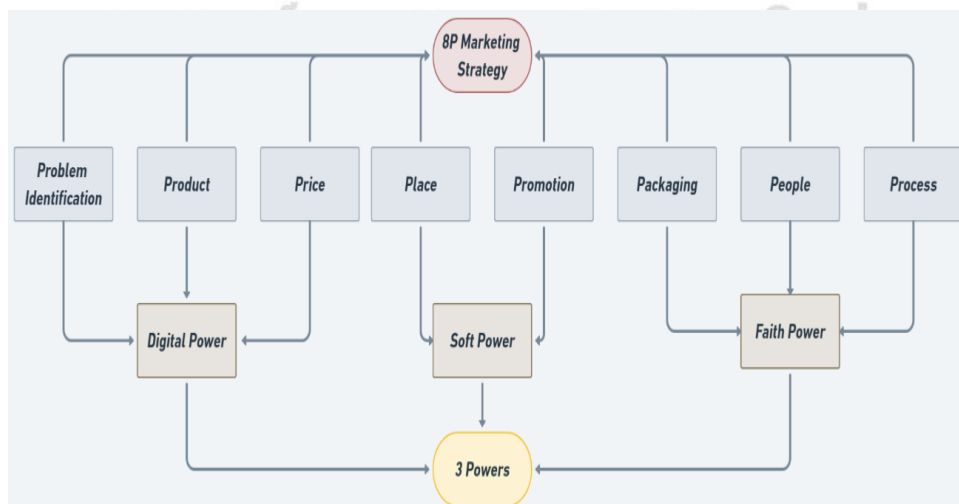


Figure 7.1 Visualization of empowerment of 3Powers by utilizing 8P marketing

Future research should delve deeper into understanding the nuances of consumer sentiment across different demographic segments within the Chinese market. Exploring regional preferences and variations can provide more granular insights, allowing for more targeted marketing strategies. Additionally, there is scope for studies on the impact of emerging trends, such as health and wellness or sustainability, on consumer purchasing behavior in the food and beverage sector. By incorporating advanced machine learning techniques and real-time data analytics, future research can enhance the precision of sentiment analysis and revenue prediction models, ultimately leading to more effective strategic planning and market responsiveness.

In recent years, Thailand's imports from China have rapidly increased, causing the proportion of imports from China to rise from about 15% to about 25% of the total value of imports over the past decade. Moreover, the products Thailand has been importing from China recently are not only for using in production within supply chains but have increasingly included consumer goods that replace domestically produced products. This issue seems not to be just a temporary matter but could be a problem that continues to affect the Thai manufacturing sector in the future.

7.1 Six methods through which Chinese products enter Thailand

7.1.1 Thai Traders (Offline/Online):

Thai sellers import goods from China to sell in local stores across Thailand or via e-commerce platforms such as Shopee, Lazada, and TikTok, catering to Thai consumers.

Impact: This could adversely affect local producers due to competition with low-cost imported goods, though the revenue remains with the Thai traders who bring and sell these products

7.1.2 Cross-border Sellers:

International sellers use various e-commerce platforms to directly sell to Thai consumers without needing to register in Thailand.

Impact: Since these sellers are not based in Thailand, they might avoid local laws and taxes, giving them a competitive edge over domestic sellers.

7.1.3 Foreign Traders Posing as Thai Businesses:

Foreign sellers establish businesses and online stores in Thailand, primarily selling imported goods from China.

Impact: These foreign sellers, masquerading as local entities, exploit legal loopholes and often evade taxes, gaining a competitive advantage over local businesses in multiple aspects. This issue extends beyond just the trading sector, affecting various industries.

7.1.4 Factory-to-Consumer Model:

E-commerce platforms like Temu enable factories in China to bypass retail stores and sell directly to Thai consumers, representing the latest business model.

Impact: Since these sellers are not based in Thailand, they may avoid local laws and taxes, giving them a competitive edge over domestic sellers and allowing them to offer significantly lower prices. Moreover, controlling product quality and customer service may become more challenging due to the absence of a clearly identifiable seller.

7.1.5 China + 1 Model:

The trade war has prompted multinational companies to shift their strategies from directly exporting from factories in China to the U.S. to routing these exports through Thailand first. In this model, Thailand imports raw materials or semi-finished products from China for production and subsequent export to other countries.

Impact: While this type of import leads to a trade deficit with China, it simultaneously stimulates exports to other markets, potentially leading to a trade surplus with other countries (such as the USA). Therefore, it's important not to focus solely on the Thai-China trade balance, as it might not provide a complete picture. Restricting these types of goods could also result in higher costs for manufacturers in Thailand.

Key Challenge: In the future, efforts should be made to maximize domestic production and develop the workforce's capacity to create more value-added products, thereby reducing imports, enhancing the value of exports, creating jobs, and increasing income domestically (like the nickel industry in Indonesia)

trade policy, the new logistics and supply chain, particularly in cross-border e-commerce between Thai and China. Most importantly, the study of government trade policy to protect measures:

TEMU operates on a Factory-to-Consumer (F2C) model, allowing direct connections between suppliers and consumers, bypassing intermediaries. This results in lower costs and often faster delivery times. The platform is gaining a significant share of the market due to its low prices and extensive supplier network.

7.2 Challenges for Thai E-commerce Platforms

Thai platforms are more dependent on a B2C or C2C model, which includes middlemen, resellers, and smaller dealers. This adds layers of cost and time, which TEMU avoids. Small businesses on these platforms are facing significant price competition and may struggle to compete with TEMU's factory-direct prices.

7.2.1 Impact on SMEs and Small Dealers

SMEs and smaller dealers, who often rely on importing and reselling products at a margin, are particularly vulnerable to the direct-to-consumer model offered by TEMU. The flow of cheaper goods directly from factories is cutting out these intermediaries, reducing their margins and market share.

7.3 Defensive Mechanisms Using Contextual Marketing

Contextual marketing involves delivering personalized, relevant content to customers based on their current situation, behavior, and environment. Thai platforms and businesses can use contextual marketing in the following ways to counter TEMU:

7.3.1 Localization and Cultural Relevance

Focus on hyper-local products that TEMU may not easily supply. Highlight unique, culturally significant products that resonate with Thai consumers. Use localized marketing campaigns that focus on national pride, community support, and the benefits of buying locally sourced products.

7.3.2 Personalized Customer Engagement

Enhance customer loyalty by offering personalized promotions, discounts, and content based on purchase history, location, and preferences. Leverage data analytics

to anticipate customer needs. Engage with customers through tailored ads on social media, where many Thai consumers spend time, offering exclusive deals and services that TEMU cannot match.

7.3.3 Value-added Services

Emphasize value-added services such as faster local delivery, easy returns, and excellent customer service, which may be harder to achieve with TEMU's international supply chain. Offer bundled services like installation, warranties, or after-sales support that provide more value than just the product itself.

7.3.4 Collaborations with Influencers

Utilize Thai social media influencers to promote local products and small businesses. Their recommendations can carry significant weight, especially when promoting culturally relevant products. Collaborate with influencers to create engaging content that highlights the benefits of shopping locally.

7.4 Governmental Measures

To support local SMEs and protect them against the growing dominance of international platforms like TEMU, the Thai government could take the following steps:

7.4.1 Support for SMEs

Provide grants or low-interest loans to SMEs to help them improve their digital infrastructure, supply chains, and marketing capabilities. Offer tax incentives or subsidies for local e-commerce businesses that promote and sell Thai-made products.

7.4.2 Strengthening Local Supply Chains

Invest in improving the efficiency of local manufacturing and supply chains to make Thai-made products more competitive in terms of price and quality. Encourage local manufacturers to adopt the F2C model within Thailand, helping them reach consumers directly through Thai e-commerce platforms.

7.4.3 Consumer Protection and Awareness

Implement stronger consumer protection regulations that ensure fair pricing, transparency, and quality standards for products sold on international platforms like

TEMU. Launch public awareness campaigns encouraging consumers to support local businesses and highlighting the long-term benefits of buying locally produced goods.

7.4.4 Regulating International E-commerce

Explore ways to impose tariffs or regulations on products sold by international platforms that directly compete with local businesses. This could include monitoring cross-border transactions and ensuring they adhere to local trade laws. Create policies that promote fair competition between local and international e-commerce platforms.

7.5 Defensive approach model:

7.5.1 Quick Win Campaign: National Campaign

To effectively stimulate international tourism in Thailand, it is projected that approximately 36.7 million international visitors will arrive in 2024, with each visitor spending an average of 50,900 baht per trip. Additionally, efforts to encourage spending among domestic Thai tourists will be reinforced through the national campaign, "Welcome to Thailand, Welcome to Thai Brands." This campaign aims to solidify Thailand's reputation as a premier tourist destination, appealing to a wide range of visitors from budget-conscious backpackers to those seeking luxury experiences.

The campaign's focus extends beyond tourism, emphasizing unique experiences that include not only travel but also shopping for Thai brands, particularly those crafted by Thai SMEs with globally recognized quality certifications. These new experiences will be accessible not just in luxury malls but also in various provincial destinations, offering tourists opportunities to explore and purchase products at competitive prices. The overarching goal is to boost local spending and enhance revenue for SMEs by attracting both domestic and international tourists.

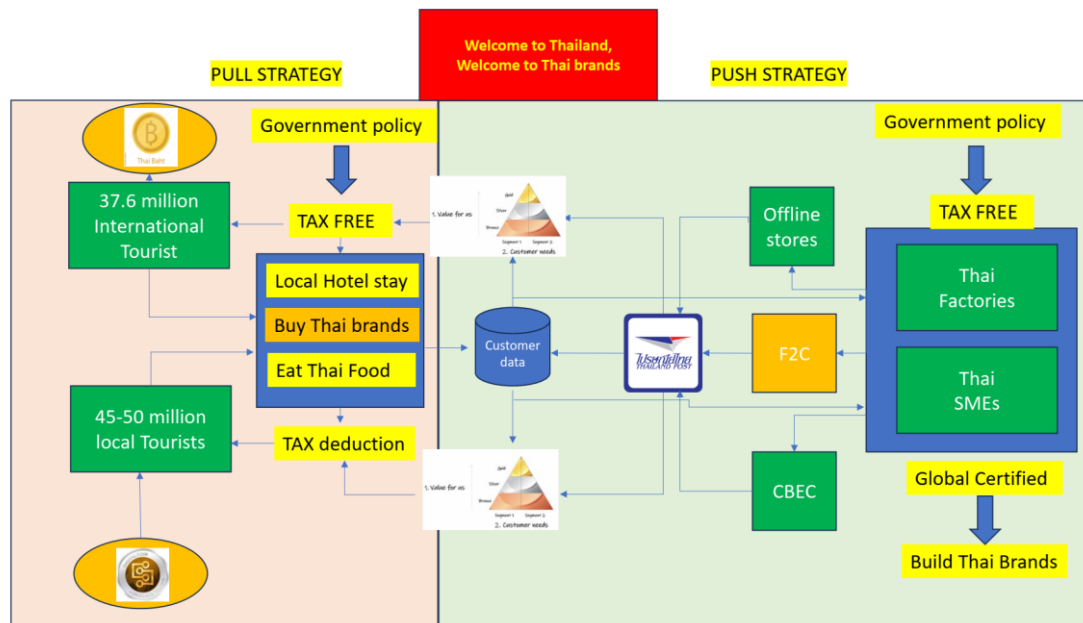


Figure 7.3 National Promotion Campaign “Welcome to Thailand, Welcome to Thai Brands”

The aforementioned national promotion campaign model can be adapted to apply the 8P strategic approach specifically to target the Chinese market, with a particular focus on the Muslim segment through e-commerce platforms. Beyond the food sector, Halal cosmetics present a promising opportunity to target both young, modern, and professional Muslims as well as aging senior Muslim women. Thai Halal cosmetic brands, known for their high quality and adherence to Halal standards, represent a category worth further research. Given Thailand's favorable taxation schemes and the high value placed on Halal-certified products, Thai Halal cosmetics could become a competitive segment in the global market, especially when promoted through e-commerce channels targeting the Chinese Muslim demographic.

7.6 Conclusion:

The combination of data-driven marketing strategies with government support could provide a robust defense against the challenges posed by platforms like TEMU. Thai SMEs and e-commerce platforms need to emphasize localization, personalized customer engagement, and value-added services while the government should take steps to support these businesses and ensure fair competition in the market.

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APPENDIX A

List of Publications.

1. Srikasem, C., Sureepong, P., Dawod, A. Y., & Chakpitak, N. (2022, December). Data-driven approach to raise the marketing and trade strategy based on Halal food product transactions of china market. In *2022 14th International Conference on Software, Knowledge, Information Management and Applications (SKIMA)* (pp. 95-101). IEEE.

Data-Driven Approach to Raise the Marketing and Trade Strategy based on Halal Food Product Transactions of China Market

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Abstract—The adaptation of halal food to Chinese food culture was investigated in a meta-analysis of this China e-commerce study. Indoctrination is a sociocultural transformation in the Coronavirus pandemic in which a community of people or an individual integrates into a different culture or country by adopting the host culture's linguistic skills, social features, nutritional patterns, and the current growth of e-commerce consumption. We apply a data-driven marketing approach and modify the STP model in marketing to analyze the product differentiation parameters according to the research. Consuming halal food prepared following Islamic standards is a religious dietary obligation imposed on all Muslims, regardless of where they reside or travel. In Arabic, the term "halal food" refers to food that is legal and allowed to ingest. Among many other dietary requirements, Islamic tenets ban the consumption of porcine food items, dead animal meat, animal blood, and any quantity of alcohol. Islam and halal eating practices were introduced to China in the early seventh century by Central Asians and Muslim missionaries traveling through the perilous ancient desert. Throughout its history, China has been a non-Muslim country, but halal food practice has been successfully assimilated and even flourished as a key component of contemporary Chinese cuisine culture. This paper addresses the two most significant variables that have contributed to the successful cultural assimilation of halal food into the new Chinese food culture in the digital era through key Chinese e-commerce sites.

Keywords— Halal market, Halal certification, Halal industry, Halal E-commerce, Chinese food, Islam in China.

I. INTRODUCTION

Since China first found COVID-19 in December 2019, interestingly, there are two economic territories on the BRI trade route that have less impact from the outbreak and are continually growing. The first territory is China's Digital Economy, which contributed 5.4 trillion USD and ranked as the world's 2nd largest economy in 2020, as reported by an industry white paper released by the China Academy of Information and Communications Technology. [1]. Moreover, China's "Belt and Road Initiative (BRI)" or "new Silk Road" was officially announced by President Xi Jinping in 2013 with the aim of strongly connecting Asia, Europe, and Africa in multi-dimensional corporations with a multi-trillion-dollar value. The journeys have linked land and maritime

routes, strategically crossing China with more than 70 countries, including Muslim countries, on both the land and marine routes. The close connection between China and Muslim countries has been shown in bilateral agreements and partnerships with Muslim countries in many respects [2]. "Fig. 1" shows China and Islamic countries.

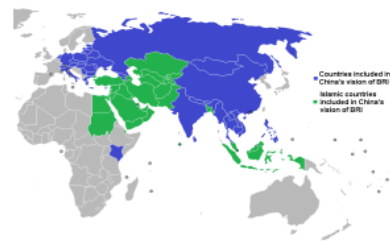


Fig. 1. China and Islamic countries in BRI [2].

Besides that, the Halal Food Sector has demonstrated a future value projection of 1.38 trillion USD in 2024 with 3.5% growth between 2019 and 2024, and the Islamic economy will reach 2.4 trillion* by 2024 [3]. The BRI policy's key strategic contribution is not only to force change in the growth of mega-capital infrastructure projects, but also to strongly stimulate international trade and the digital transformation movement to disrupt traditional industries and increase growth in many sectors, particularly the global halal food sector. China's relationship with the Islamic world is under "the Belt and Road Initiative," where the 1.44 billion Chinese population meets the 1.9 billion Muslims globally. The halal food market, therefore, must start rising along the journey. Displayed "Fig. 2" China Belt and Road Initiative.

2. Srikasem, C., Sureephong, P., Dawod, A. Y., Chakpitak, N., & Chanaim, S. (2024). Impact of Ramadan on Halal Food Marketing Strategies in the Chinese Market: A Data Analytics Approach. *International Journal of Religion*, 5(10), 1189-1202.

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LETTER OF ACCEPTANCE

Dated: 7th June , 2024

Dear Author (S):

Chaowapark Srikasem , Pradorn Sureephong , Ahmad Yahya Dawod1, Nopasit Chakpitak1, Somsak Chanaim1.,
Greetings!

We are delighted to inform you that our scientific and review committee approved your article titled "**Impact of Ramadan on Halal Food Marketing Strategies in the Chinese Market: A Data Analytics Approach**" (Article no: **IJOR-024-2565**) for publication in Volume 5 (2024) of the International Journal of Religion (IJOR).

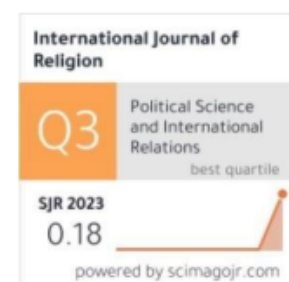
International Journal of Religion **IJOR** is abstracted and indexed in Scopus, ERIH Plus, Norwegian Register for Scientific Journals, RePEc, Google Scholar, Sherpa RoMEO

Please ensure that the publication fee is paid within a period of 5 business days. We are assured that our collaboration will contribute to the advancement of global knowledge creation and sharing. Please feel free to reach out to us should you have any additional inquiries.

Best Regards,

harper

Dr. Harper Smith
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Impact of Ramadan on Halal Food Marketing Strategies in the Chinese Market: A Data Analytics Approach

Chaowapark Srikasem¹, Pradorn Sureephong², Ahmad Yahya Dawod³, Nopasit Chakpitak⁴ and Somsak Chanaim⁵

Abstract

This study investigates the integration of halal food into Chinese multinational culture amid the Coronavirus epidemic. Applying a thorough data analytics procedure, the research focuses on the evolving e-commerce landscape within China. The adaptation under scrutiny includes a wide range of sociocultural transformations, including linguistic proficiency, social norms, dietary preferences, and e-commerce consumption habits from various cultural domains. A data-driven marketing strategy's analytical structure, supported by an updated Segmentation, Targeting, and Positioning (STP) model, carefully examines product differentiation criteria. Furthermore, the investigation includes the implementation of a prediction model that uses complex algorithms to estimate market trends and consumer preferences. The term "halal" comes from Arabic and refers to food that is considered permissible for consumption excluding porcine products, carrion, blood, and alcohol. Halal cuisine, which adheres to Islamic dietary regulations, is critical to Muslims' religious devotion around the globe. Halal dietary habits are integrated into Chinese cuisine through major e-commerce platforms. This study utilizes a data-analytics marketing model to analyze transactional data from Taobao.com and Tmall.com, aiming to understand purchasing patterns of halal food products in China. The analysis highlights significant seasonal fluctuations, particularly during major festivals such as Ramadan, Chinese New Year, and Eid, which heavily influence sales.

Keywords: China E-Commerce, Data-Analytics, Halal Food Market, Halal E-Commerce, Predictive Analysis

INTRODUCTION

China's halal food market experiences substantial growth due to its large Muslim population and rising demand for quality halal products, further propelled by the Belt and Road Initiative (BRI) promoting trade and cultural exchanges with Muslim-majority nations. The BRI facilitates halal food supply chain integration, augmenting import/export of halal-certified products and establishing China as a significant contributor to the global halal food market. The COVID-19 pandemic showcased the halal industry's resilience, offering growth prospects and a crucial opportunity for its enhancement, benefiting both the Muslim community and involved nations. (Hidayat et al., 2022; Rafiki et al., 2021). China's \$5.4 trillion digital economy, minimally affected by COVID-19, and the Belt and Road Initiative (BRI), announced by President Xi Jinping in 2013 to enhance cooperation with over 70 countries, remain central to China's economic strategy. (Figure 1) (Bruni, 2019). The significant partnerships and bilateral agreements between China and Muslim countries underscore the strategic importance of these connections.

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3. Srikasem, C., Sureephong, P., Dawod, A. Y., Chakpitak, N., & Chanaim, S. (2024). Thai Halal Food as Soft Power for Thailand Towards the Chinese Market: A Sentimental Analysis Approach. *Przestrzeń Społeczna (Social Space)*, 24(2), 226-243.



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Dear Authors

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Congratulations upon the acceptance of your research paper into our Scopus Indexed Journal.

It's my pleasure to inform you that, after the peer review, your paper, "**THAI HALAL FOOD AS SOFT POWER FOR THAILAND TOWARDS CHINESE MARKET: A SENTIMENTAL ANALYSIS APPROACH.**" has been ACCEPTED to publish with **Przestrzen Spoteczna (Social Space) Journal**, ISSN: 2084-1558; E-ISSN: 2084-7696. It will be published in no 1/2024 (24) issue. I believe that our collaboration will help to accelerate the global knowledge creation and sharing one-step further.

Sincerely,

Managing Editor

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