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PRE-ORDER SYSTEM FOR DEMAND FORECASTING TO MITIGATE GHARAR RISK IN UMSU STUDENT COTTAGE INDUSTRY

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Abstract

This investigation studies implementing a pre-order system as a demand-forecasting method to lessen gharar (uncertainty) risk in the student cottage industry at Universitas Muhammadiyah Sumatera Utara (UMSU). Student-run cottage industries frequently face demand uncertainty, overproduction, and inventory mismanagement, which can create gharar in transactions and violate Islamic business ethics. This research uses a qualitative descriptive approach, employing semi-structured interviews with three UMSU students who manage cottage industries: GradBouquet by Rezeki Khairani, Eid Catering by N. Damanik, and Sorgumie by Sandy I. The findings show that demand forecasting helps entrepreneurs set optimal production timing and product variants, reducing losses from perishable goods such as flowers that wilt quickly or seasonal food that spoils quickly, and lessening speculative risk. From a Sharia business perspective, the pre-order mechanism aligns with the principle of al-bay' al-mausuf fi al-dzimmah (sale of described goods) and helps avoid gharar through clear specifications, agreed prices, and certainty of delivery. The study recommends that student entrepreneurs adopt digital pre-order platforms and simple forecasting methods to improve operational efficiency and Sharia compliance.

Keywords*: Pre-Order System, Demand Forecasting, Gharar Risk, Student Cottage Industry*

1. INTRODUCTION

A cottage industry refers to a small-scale, home-based business in which family members or a limited number of workers produce goods using simple equipment and local resources. In recent years, this business model has expanded among university students as a means to develop entrepreneurial skills and meet living needs. However, student-run micro-scale businesses encounter pronounced challenges, particularly in managing demand uncertainty. Producing seasonal, perishable goods tied to specific occasions exposes operators to potential losses if they cannot precisely estimate production quantities and optimal selling periods. The phenomenon of student entrepreneurship in Indonesia has grown significantly, with many students turning to small-scale businesses as a way to gain practical experience and supplement their income while studying (Hutasuhut & Aditia, 2022). This trend is particularly visible at Universitas Muhammadiyah Sumatera Utara (UMSU), where several students have established cottage industries that operate on a pre-order basis. The emergence of these businesses reflects a broader shift in Indonesian higher education toward integrating entrepreneurial competencies into the curriculum, as universities increasingly recognize that graduates need not only theoretical knowledge but also practical skills for navigating the labor market (Satriadi et al., 2022).

Uncertainty in demand forecasting also affects the principles managing Islamic transactions. In Islamic jurisprudence (fiqh muamalah), transactions involving uncertainty regarding quantity, price, and delivery time are classified as gharar. Gharar can cause disputes, injustice, and losses for one party; therefore, Islamic law stresses clarity and mutual consent in every contract (Yazid et al., 2023). Cottage industry operators who produce goods speculatively, without demand forecasting, risk engaging in gharar because production quantities are not based on clear orders or actual needs. Consequently, a mechanism is required to bridge market demand and production capacity transparently and in accordance with sharia principles. The prohibition of gharar is rooted in the principle that every transaction must be free from excessive ambiguity that could lead to injustice. In the context of student-run businesses, this principle becomes even more relevant because the operators often lack the financial buffer to absorb losses from unsold inventory. Recent studies on digital finance have also highlighted the importance of financial literacy and risk management in fostering sustainable MSME growth, which reinforces the need for structured mechanisms such as demand forecasting (Syahrani & Siregar, 2025).

A pre-order system combined with demand forecasting effectively reduces gharar risk. The pre-order system enables business operators to receive orders before production, allowing them to determine the quantity and specifications of goods based on actual demand. Demand forecasting helps predict demand trends during specific periods or seasons, enabling more targeted production planning. This approach diminishes the risk of unsold goods and raises transparency in sales contracts. From a Sharia perspective, this system is consistent with al-bay' al-mausuf fi al-dzimmah, the sale of goods with clearly described specifications and later delivery, provided the nature, quantity, price, and delivery time are clear (Uriawan et al., 2025). The pre-order mechanism thus serves a dual function: it is an operational tool for managing production and a contractual device that reduces ambiguity in the exchange. Recent scholarship on digital transactions in Islam confirms that e-commerce platforms can facilitate the implementation of such contracts by providing structured channels for specifying goods and recording agreements (Salsabila et al., 2024).

This research examines three cottage industries run by students at Universitas Muhammadiyah Sumatera Utara (UMSU): GradBouquet by Rezeki Khairani in the floral arrangement sector, Eid Catering by N. Damanik in the seasonal Eid (Lebaran) catering sector, and Sorgumie by Sandy I., which produces sorghum-based food products. Although these businesses provide considerable opportunities, they also encounter fundamental challenges: they are not widely recognized by consumers because their products are not always readily available; their operations rely heavily on a pre-order system that is highly dependent on seasonal demand; they do not market their products through social media; and their promotional efforts have so far relied only on word-of-mouth communication. These circumstances limit market reach and prevent potential customers from accessing their products, despite ongoing demand for seasonal and customized goods.

Each of the three cottage industries has a different seasonal pattern and production timing. GradBouquet by Rezeki Khairani produces flower bouquets tied to specific moments, such as graduation ceremonies and other celebrations. The owner said fresh flowers wilt quickly and cannot be stored long, so production must follow the predicted season. Eid Catering by N. Damanik offers seasonal catering services in high demand only during Ramadan and Eid al-Fitr. The owner explained that orders surge only during the Lebaran season and drop sharply afterward, so production must be adjusted to that period. Sorgumie by Sandy I. produces sorghum-based food products whose demand is influenced by customer trends and seasonal factors. The owner mentioned that the products have a limited shelf life, so production must be planned carefully to avoid excess stock. In all three businesses, production is not continuous; it adjusts to the season and incoming orders because the products are perishable and demand is not stable throughout the year. Aswana et al. (2024) emphasize that sharia values in MSME production, such as honesty and fairness, are not merely ethical adornments but practical foundations for managing businesses that rely on trust and transparency.

Preliminary interviews with the three business owners revealed several shared characteristics: production depends heavily on seasons or occasions; products are perishable and cannot be stored for long-term orders; and orders are managed through a pre-order mechanism. The interviews also indicated that they have not implemented systematic forecasting methods and do not use social media as a marketing channel, which limits their market reach. These findings highlight the need to explore how combining a pre-order system with demand forecasting can improve profitability in the student cottage industry. This is expected to contribute theoretically to Islamic business studies, particularly in risk management and production planning, and practically to student micro-entrepreneurs by supporting more efficient, transparent, and sharia-compliant business management.

2. RESEARCH METHOD

This study adopts a qualitative descriptive method to investigate how implementing a pre-order system serves as a demand-forecasting strategy to mitigate gharar risk in student-run cottage industries at Universitas Muhammadiyah Sumatera Utara (UMSU). Primary data were obtained through semi-structured interviews with three business owners, namely GradBouquet by Rezeki Khairani, Eid Catering by N. Damanik, and Sorgumie by Sandy I., centering on their business processes, seasonal demand patterns, production timing, pre-order mechanisms, and understanding of uncertainty (gharar) in transactions,

while secondary data were collected from books, journal articles, and relevant documents on cottage industry, demand forecasting, pre-order systems, and gharar in Islamic business ethics.

Data were collected through interviews, observation of production processes and order management, and documentation of product records, order notes, and promotional materials, and were then analyzed using qualitative descriptive analysis, including data reduction, data display, and conclusion drawing, to answer the research questions. To confirm data validity, the study used source triangulation by comparing information from the three informants with supporting documents. The qualitative descriptive design was chosen because it allows the researcher to capture the nuances of entrepreneurial decision-making in small-scale, sharia-conscious businesses, where quantitative measures alone may not adequately reflect the reasoning behind production and pricing choices. The triangulation process was further strengthened by cross-checking interview statements against order records and social media activity logs, where available, to ensure that the reported practices were not merely aspirational but reflected actual operational routines. The choice of three informants was guided by the principle of information richness rather than statistical representativeness. Each business represents a distinct segment of the student cottage industry, floral arrangements, seasonal catering, and processed food, and each faces a different configuration of perishability, seasonality, and customer expectations. By comparing these three cases, the study aims to identify patterns that cut across sectors while also capturing the unique challenges that each business faces

3. RESULTS

3.1. Overview of the Three Cottage Industries

This research involved three cottage industries managed by students of Universitas Muhammadiyah Sumatera Utara (UMSU), namely GradBouquet by Rezeki Khairani, Eid Catering by N. Damanik, and Sorgumie by Sandy I. All three businesses are home-based, use simple equipment, and rely on a pre-order system, producing orders only after receiving them. Their products share similar characteristics: seasonal demand, perishable nature, and dependence on specific moments. These characteristics make demand forecasting key to their operations. The businesses operate in different sectors but share a common vulnerability to demand volatility, which makes the pre-order mechanism not merely a convenience but a survival strategy. The comparative profile of the three businesses is summarized in Table 1, which maps each business by product type, seasonal pattern, perishability, and pre-order practice.

Table 1. Comparative Profile of the Three Cottage Industries

Business Name	Owner	Product Type	Seasonal Pattern	Perishability	Pre-Order Practice
GradBouquet	Rezeki Khairani	Flower bouquets for graduation and celebrations	Tied to graduation ceremonies and celebratory	Fresh flowers wilt quickly within days	Orders received before production; bouquet

			moments		variants and quantities based on confirmed orders
Eid Catering	N. Damanik	Seasonal catering services	High demand during Ramadan and Eid al-Fitr; drops sharply afterward	Cooked food spoils quickly; ingredients perishable	Pre-orders estimate ingredient quantities and worker needs during Lebaran season
Sorgumie	Sandy I.	Sorghum-based food products	Influenced by consumer trends and seasonal factors	Limited shelf life; processed food products	Pre-orders plan production to avoid exceeding shelf life and excess stock

Source: Primary data, 2026

3.2. Seasonal Demand Patterns and Production Timing

The findings show that each business has a distinct seasonal pattern. GradBouquet produces flower bouquets that are closely tied to graduation ceremonies and other celebratory moments. The owner said fresh flowers wilt quickly and do not store well, so production must follow the predicted season. Eid Catering offers seasonal catering services in high demand only during Ramadan and Eid al-Fitr. The owner explained that orders surge only during the Lebaran season and drop sharply afterward, so production must be adjusted to that period. Sorgumie processes sorghum-based food products whose demand is influenced by consumer patterns and certain seasons. The owner mentioned that the products have a limited shelf life, so production must be planned carefully to avoid excess stock. These data indicate that production in all three businesses is not continuous but adjusts to the season and incoming orders. This pattern confirms that demand forecasting is not simply an administrative tool but a key requirement for business survival. Without forecasting, firms risk producing unsold goods, leading to waste and financial loss (Kaizer et al., 2022). The seasonal pattern observed in these three businesses is consistent with the broader literature on perishable-goods MSMEs. A study on predictive analysis for perishable goods emphasizes that demand estimation must account for fluctuating demands and the impact of celebrations and festivities, which is precisely the challenge faced by GradBouquet and Eid Catering (Predictive Analysis, 2022).

For Eid Catering, the concentration of demand during a single religious holiday creates a sharp peak that requires careful planning of ingredient procurement and labor scheduling. Sorgumie faces a different challenge: its products have a longer shelf life than fresh flowers but still require planning to avoid excess stock that ties up working capital. These differences illustrate that demand forecasting must be tailored to the specific

perishability profile and seasonal rhythm of each business. The commitment to halal and hygienic production adds another layer of complexity to demand planning, because sourcing and preparation must meet religious standards while remaining economically viable (Aswana et al., 2024).

3.3. Implementation of the Pre-Order System as Demand Forecasting

The pre-order system functions as a practical form of demand forecasting in the three businesses. Orders received before production provide real data on demand quantity, type, and timing. In GradBouquet, pre-orders help the owner decide how many bouquets to produce and which flower variants suit a particular moment. In Eid Catering, pre-orders let the owner estimate ingredient quantities and the number of workers needed during the Lebaran season. In Sorgumie, pre-orders help the owner plan production so that the products do not exceed their shelf life. From a business perspective, this mechanism lowers the risk of overproduction and underproduction. It also improves efficiency in using raw materials, labor, and time. From a sharia perspective, the pre-order system clarifies the object, quantity, price, and delivery time, the key elements required to avoid gharar in a sale and purchase contract. This practice aligns with al-bay' al-mausuf fi al-dzimmah, in which goods are sold based on clear specifications and delivered later. The alignment with sharia principles is not merely incidental. Salsabila et al. (2024) argue that e-commerce platforms, through features such as pre-orders and digital payment systems, can facilitate salam contracts more transparently and efficiently. In the context of these three cottage industries, the pre-order mechanism serves a dual function: it is simultaneously an operational tool for demand management and a contractual device that reduces ambiguity in the exchange.

The pre-order system also creates a feedback loop that improves forecasting accuracy over time. Each completed order provides data that can be used to refine future forecasts. For example, GradBouquet can track how many bouquets were ordered for graduation ceremonies in previous years and use that information to anticipate demand for the next graduation season. Eid Catering can analyze the number of orders received during Ramadan and use that data to plan ingredient purchases for the following year. Sorgumie can monitor which sorghum-based products are most popular during different seasons and adjust its production accordingly. This iterative process of forecasting, ordering, and learning is consistent with the principles of continuous improvement that underlie effective MSME management. A recent study on pre-order sales forecasting using time series algorithms confirms that even simple forecasting models can significantly improve operational efficiency for small businesses (Sampedro, 2024).

3.4. Mitigation of Gharar Risk through Pre-Order and Forecasting

The results show that the three business owners understand uncertainty in their transactions, even though they do not use the term gharar explicitly. They recognize that producing goods absent clear orders can lead to losses, especially because their products are perishable and seasonal. The pre-order system, combined with simple forecasting based on previous sales and consumer feedback, helps them reduce this uncertainty. In Islamic business ethics, gharar occurs when there is ambiguity about the object, quantity, price, or delivery time (Yazid et al., 2023). The pre-order system reduces this vagueness because the

transaction is based on an agreement made before production. The buyer knows the specifications and price, while the seller knows the quantity and delivery time. This lucidity protects both parties from disputes and injustice. Therefore, implementing a pre-order system supported by demand forecasting can be a practical strategy for mitigating gharar risk in student cottage industries. The mitigation of gharar through pre-order is particularly relevant for student entrepreneurs who operate with limited capital and cannot absorb the losses associated with speculative production. Koswari et al. (2026) note that the shift from a stock-based to a demand-driven model through pre-order increases efficiency, reduces excess stock, and aligns with the principles of maslahah, tawazun, and the prohibition of israf. In the cases studied here, the pre-order system does not eliminate risk entirely, production still involves uncertainties related to weather, supplier reliability, and last-minute changes in customer demand, but it reduces the most salient form of gharar, namely the uncertainty regarding whether goods will be sold at all. This reduction in uncertainty is what distinguishes the pre-order model from speculative production. A study on digital communication and gharar in online transactions further confirms that unclear product descriptions and inaccurate information are primary sources of gharar, which the pre-order system addresses by requiring clear specifications before production begins (Garuda, 2023).

The owners' implicit understanding of gharar is noteworthy. Although they may not use the technical term, their business practices reflect an intuitive grasp of the risks that gharar represents. They know that producing without orders is risky, and they have developed informal mechanisms, such as requiring down payments or confirming orders before purchasing materials, to manage that risk. These practices, while not explicitly framed in sharia terms, are consistent with the objectives of Islamic law in protecting parties from unfair uncertainty. This finding suggests that sharia-compliant business practices can emerge organically from the operational needs of small businesses, even in the absence of formal religious training.

3.5. Obstacles Faced by the Business Owner

Despite the benefits of the pre-order and forecasting system, the three businesses face fundamental obstacles. First, consumers do not widely recognize them because their products are not always readily available and depend on seasonal demand. Second, they do not market their products through social media, and their promotional efforts have so far relied only on word-of-mouth communication. This indicates that the businesses have not fully optimized digital marketing to support their pre-order and forecasting systems. Social media could announce production schedules, display product catalogs, and receive orders more systematically. With better promotion, the businesses could expand their market coverage, increase order volume, and improve demand-forecasting accuracy (Angela et al., 2026). The absence of social media marketing is a significant constraint because it limits the data available for forecasting. A pre-order system generates valuable demand signals, but those signals are only as good as the reach of the order channel. If the businesses rely solely on word-of-mouth, the volume and diversity of orders are constrained by the size of the owners' immediate social networks. Expanding the order channel through social media would not only increase sales but also improve the quality of demand data, enabling more accurate forecasting and more efficient production planning. This is consistent with the

finding that digital marketing capabilities are increasingly important for MSME performance, particularly in the context of demand-driven production models (Purnama et al., 2026).

The literature on digital marketing for MSMEs in Indonesia supports this observation. Hastuti (2025) emphasizes that low sharia financial literacy among MSME actors is a major challenge in developing Islamic economics in North Sumatra, and that digital platforms can help bridge this gap by providing accessible information and transaction channels. Similarly, Sihotang (2024) highlights the importance of halal value chain integration for MSMEs, noting that digital visibility is a prerequisite for accessing broader markets. For the three cottage industries in this study, the lack of digital presence means that they are invisible to potential customers who rely on social media and online search to discover products and services. This invisibility perpetuates their dependence on seasonal, network-based demand and limits their ability to grow beyond a small circle of acquaintances. Aulia dan Siregar (2023) juga mencatat bahwa pengembangan UMKM dipengaruhi oleh kualitas pelayanan dan produk yang ditawarkan, yang dalam konteks digital mencakup visibilitas dan aksesibilitas informasi produk.

4. DISCUSSION

The findings of this study have several implications for student entrepreneurship and sharia compliance. First, the pre-order system demonstrates that sharia-compliant business practices are not antithetical to commercial success. On the contrary, the discipline required by the pre-order mechanism, clear specifications, agreed prices, confirmed delivery times, is precisely what enables businesses to operate efficiently and avoid the waste and disputes associated with gharar. Student entrepreneurs who adopt this model are not only fulfilling religious obligations but also building a foundation for sustainable business growth. The alignment between operational efficiency and religious compliance observed in these three businesses suggests that sharia principles can function as practical risk-management tools rather than abstract ethical ideals. This finding resonates with the broader argument that Islamic business ethics, when properly understood, provide a coherent framework for decision-making that enhances rather than constrains business performance.

Second, the study highlights the importance of digital literacy for student entrepreneurs. The three businesses studied here have mastered the operational aspects of pre-order but have not leveraged digital tools to expand their reach. Integrating digital marketing into the pre-order system would allow them to reach a wider audience, collect more diverse demand data, and improve forecasting accuracy. Universities can play a role in this by providing training and mentorship in digital marketing and e-commerce, as well as by facilitating access to platforms that support pre-order transactions (Lubis et al., 2023). The absence of digital marketing is not merely a technical gap but a strategic limitation that constrains the growth potential of these businesses. In an increasingly digital marketplace, visibility is a prerequisite for demand generation, and without it, even the most well-designed pre-order system will struggle to attract sufficient orders to sustain operations.

Third, the experience of these three businesses suggests that sharia compliance is not a burden but a competitive advantage. In an increasingly crowded marketplace, consumers are looking for businesses they can trust, businesses that are transparent about their products, fair in their pricing, and reliable in their delivery. The pre-order system, by

making these qualities explicit, positions student-run cottage industries as trustworthy and professional. This alignment between ethical business practice and commercial success is a message that resonates with the broader movement toward ethical consumerism and sustainable entrepreneurship. The integration of sharia values into business operations, as demonstrated by these three cottage industries, offers a model that can be replicated by other student entrepreneurs seeking to build businesses that are both profitable and ethically grounded (Siregar & Syahrani, 2025).

From a theoretical perspective, this study contributes to the literature on gharar by demonstrating how operational mechanisms such as pre-order systems can mitigate uncertainty in practice. While classical fiqh discussions of gharar tend to focus on contractual ambiguity, the findings here suggest that gharar can also arise from production and inventory decisions that precede the formal contract. By aligning production with confirmed orders, the pre-order system addresses this operational dimension of gharar, complementing the contractual safeguards that classical jurisprudence emphasizes. This insight has practical implications for MSMEs seeking to operate in accordance with Islamic principles: compliance is not limited to the wording of contracts but extends to the entire value chain, including the planning and production processes that precede the sale.

The limitations of this study should also be acknowledged. The findings are based on three cases in a single university context, which limits their generalizability. Future research could expand the scope to include a larger number of student-run businesses across different universities and sectors, as well as incorporate quantitative methods to measure the impact of pre-order systems on financial performance and gharar mitigation more rigorously. Additionally, longitudinal studies could track how student entrepreneurs adapt their forecasting and pre-order practices over time as they gain experience and as market conditions change. Despite these limitations, the study provides a grounded account of how pre-order systems function as demand-forecasting mechanisms in sharia-conscious micro-businesses and offers practical recommendations for student entrepreneurs, universities, and policymakers seeking to support sustainable and ethically grounded entrepreneurship.

5. CONCLUSION

First, the three cottage industries managed by UMSU students, GradBouquet by Rezeki Khairani, Eid Catering by N. Damanik, and Sorgumie by Sandy I., share similar characteristics: seasonal demand, perishable products, and dependence on specific moments. This makes demand forecasting important to prevent overproduction and financial loss. Second, the pre-order system functions as a practical form of demand forecasting in these businesses. Orders received before production provide actual data on the quantity, type, and timing of demand, enabling the owners to plan production more accurately and efficiently. This mechanism also reduces the risk of losses from unsold and perishable goods. Third, implementing a pre-order system supported by demand forecasting helps mitigate gharar risk. The system clarifies the object, quantity, price, and delivery time, the key elements needed to avoid uncertainty in a sale and purchase contract. This practice is consistent with the principle of al-bay' al-mausuf fi al-dzimmah in Islamic business ethics. Fourth, the three businesses still face fundamental obstacles, particularly limited consumer recognition due to seasonal availability and the absence of social media marketing, with promotional efforts relying only on word-of-mouth communication. These conditions limit

market reach and reduce the accuracy of demand forecasting. Therefore, strengthening the pre-order system with digital marketing and systematic forecasting methods is an important step to improve business efficiency, reduce gharar risk, and support the sustainability of student cottage industries.

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