



HELLO FRESH

Innovating Business Models with Gen AI

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Executive Summary

This report outlines a strategic proposal for integrating Generative AI (GenAI) into HelloFresh, a leading subscription-based meal kit service in the Netherlands. As consumer demand for customization and convenience in the food industry grows, HelloFresh must innovate to sustain its competitive edge in a dynamic market characterized by intense rivalry and shifting consumer preferences.

Integrating GenAI into HelloFresh's business model thus offers a transformative opportunity. By providing customized meal recommendations, automating customer support with chatbots, and utilizing data for improved demand forecasting, HelloFresh can strengthen customer relationships, expand its market base, and create new revenue streams. Currently, HelloFresh operates with a linear value chain and limited customer insights. The proposed GenAI integration aims to transition the company from a Supplier to an Ecosystem Driver model, similar to Amazon, facilitating a deeper understanding of customer needs.

HelloFresh holds a significant share of the Dutch meal kit delivery market, however, an analysis using Porter's Five Forces reveals notable challenges. Customers possess considerable bargaining power, allowing for easy provider switching, while suppliers have limited leverage due to HelloFresh's scale and sustainable practices. The threat of new entrants remains substantial, and competition is intensifying. To maintain its market leadership, integrating Generative AI into HelloFresh's strategy is crucial, with a focus on personalized meal plans and enhanced supply chain management.

The proposed four-phase implementation plan—Discovery, Devise, Deploy, and Sustain—ensures a systematic integration of GenAI. This includes stakeholder engagement, technical capability development, full-scale implementation of GenAI systems, and ongoing monitoring for effectiveness. This integration is expected to reduce transaction costs, enable data monetization, and provide a competitive edge in a crowded market.

Acknowledged risks include customer acceptance, algorithm bias, and technical complexity. To mitigate these, the report recommends ongoing model refinement, user feedback collection, and comprehensive research into customer preferences. Training the GenAI system to align with HelloFresh's values of sustainability and affordability will further enhance its effectiveness. Ultimately, this strategy aims to strengthen HelloFresh's market position, ensuring long-term success in a competitive landscape.

1. Introduction

The rapid rise of GenAI is driving significant transformations across industries, empowering companies to deliver hyper-personalized services, enhance operational efficiency, and innovate at an unprecedented scale. GenAI's ability to analyze vast datasets and generate real-time, customized solutions is reshaping how businesses interact with customers and optimize their internal processes. This is particularly crucial in sectors like the food industry, where consumer demand for personalization, health-conscious choices, and convenience is rapidly increasing. Hence, the urgency of GenAI's adoption into HelloFresh's business is undeniable to avoid being disrupted by other competitors. In this document, we will first examine HelloFresh's business model and outline the objectives and goals of the project. Following that, we will analyze the meal-kit delivery market to gain a deeper understanding of the industry's competitiveness in the Netherlands. A detailed implementation plan will then be presented, outlining the necessary steps. We will also provide an evaluation of the benefits, a risk analysis, and conclude with recommendations for the way forward.

2. Business Description

2.1. Current Business Model

HelloFresh operates as a subscription-based meal kit service that provides recipes and high-quality ingredients and then delivers them directly to customers' doors. Its core value proposition concentrates on providing a convenient solution for individuals looking to enjoy healthy, home-cooked meals without the hassle of meal planning and grocery shopping. HelloFresh differentiates its service by simplifying the meal preparation process and minimizing cooking time. The company focuses on customer segments including professionals, students, families, health-conscious individuals, and fitness enthusiasts who have busy schedules but prioritize fresh, high-quality ingredients. Customers primarily interact with HelloFresh through its digital platforms, including the website and mobile application, where they can manage subscriptions, select meals, and adjust their orders. Meanwhile, social media is used for marketing and engaging with customers. As HelloFresh employs a subscription-based model, most of its revenue is generated from meal kit subscriptions, with additional income from premium meal selections and special promotions. Core operations involve developing recipes, creating menus, sourcing ingredients, and handling logistics, all supported by a network of suppliers and technology partners.

(HelloFresh SE, 2024). Table 1 illustrates HelloFresh's current business model by using the Business Model Canvas.

Table 1: Current Business Model Canvas

Key partners <ul style="list-style-type: none"> - Local and international ingredient suppliers - Delivery service providers for logistics and distribution - Technology providers for website and app management 	Key activities <ul style="list-style-type: none"> - Recipe development and menu creation - Supply chain management for ingredient sourcing - Packaging and distribution of meal kits - Marketing and customer acquisition efforts 	Key resources <ul style="list-style-type: none"> - Supplier partnership for fresh ingredients - Technology platform (website and app) for managing subscriptions and orders - Logistics and delivery networks
Value propositions <ul style="list-style-type: none"> - Convenient, healthy, home-cooked meals without meal planning or grocery shopping - Pre-portioned ingredients with easy-to-follow recipes delivered weekly - Fresh, high-quality ingredients for health-conscious consumers 	Customer relationships <ul style="list-style-type: none"> - Personalized meal options based on consumer preferences - Strong retention rate through recipe flexibility and meal customisation - Customer support through chat and email 	Channels <ul style="list-style-type: none"> - Website and mobile app for subscription management, meal selection, and order adjustments - Social media platforms for marketing and promotions
Customer segments <ul style="list-style-type: none"> - Students - Busy professionals and working individuals - Families - Health-conscious consumers - Gym enthusiasts and 	Cost structure <ul style="list-style-type: none"> - Ingredient sourcing and packaging costs - Delivery and logistics expenses - Marketing and customer acquisition costs - Platform maintenance and 	Revenue streams <ul style="list-style-type: none"> - Subscription-based model for weekly meal kits - Premium meal options for an additional fee - Occasional one-off sales or promotions

fitness-focused individuals	technology development	
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2.2. GenAI Integration

Integrating GenAI has the potential to significantly transform HelloFresh's business model by enhancing personalization and innovation. GenAI could enable the company to offer tailored meal recommendations based on individual dietary preferences, health goals, and budget constraints. GenAI could enable the company to offer customized meal recommendations based on individual dietary preferences, health goals, and budget constraints. For instance, GenAI could suggest meals rich in specific nutrients for customers with particular health conditions (e.g. iron deficiency). Recipes can be automatically generated based on customer feedback, food trends, or ingredient availability. This level of personalisation can allow HelloFresh to broaden its customer segments, offering specialized meal plans for health-conscious and budget-focused individuals. GenAI-powered channels like HelloFresh's website and mobile app can provide meal suggestions and health insights. Furthermore, GenAI-driven chatbots can automate customer support processes, delivering 24/7 assistance and personalised engagement. Revenue streams could diversify by offering premium AI services, such as personalised fitness plans or health insights, while key activities like recipe development and supply chain management could become more efficient with GenAI tools. Although GenAI development and infrastructure costs would initially increase, these technologies would become key resources. Table 2 illustrates HelloFresh's business model after the integration by using the Business Model Canvas.

Table 2: GenAI-enhanced Business Model Canvas

Key partners	Key activities	Key resources
<ul style="list-style-type: none"> - AI technology partners for personalization and operational efficiency - Health and wellness experts for personalized meal plans - Local and international ingredient suppliers 	<ul style="list-style-type: none"> - AI-enhanced recipe development based on customer preferences, health needs, and seasonal ingredients - Predictive supply chain management to optimize procurement and reduce 	<ul style="list-style-type: none"> - AI technology and data infrastructure for personalisation and automation - Customer data for meal personalisation and recipe development - Partnerships with suppliers

<ul style="list-style-type: none"> - Delivery service providers for logistics and distribution - Technology providers for website and app management 	<ul style="list-style-type: none"> food waste - Automated customer interactions through AI chatbots and virtual assistants - Continuous recipe innovation using GenAI - Marketing and customer acquisition 	<ul style="list-style-type: none"> and health experts - Logistics and delivery networks
Value propositions <ul style="list-style-type: none"> - Personalized nutrition plans and meal recommendations generated by GenAI - Virtual dietician features offering meal suggestions based on health conditions - Continuous recipe development aligned with customer preferences and food trends - Convenience of fresh, pre-portioned ingredients delivered weekly, saving time on meal planning and grocery shopping 	Customer relationships <ul style="list-style-type: none"> - AI-driven customer support with 24/7 chatbot assistance - Personalized engagement through tailored meal suggestions based on health goals and preferences - Continuous customer interaction through voice assistants and personalized updates 	Channels <ul style="list-style-type: none"> - AI-powered website and mobile app offering personalized meal suggestions and insights - AI-generated marketing content (personalized emails, targeted social media ads)
Customer segments <ul style="list-style-type: none"> - Health-conscious individuals seeking personalized meal plans - Fitness enthusiasts requiring customized, 	Cost structure <ul style="list-style-type: none"> - Investment in AI technology and ongoing maintenance - Ingredient sourcing and packaging costs 	Revenue streams <ul style="list-style-type: none"> - Subscription model with AI-powered personalized meal plans - Premium AI services (e.g. advanced health insights,

high-protein meal options - Students and budget-conscious individuals looking for affordable, nutritious meals - Busy professionals and families seeking convenience in meal preparation	- Delivery and logistics expenses - Marketing and customer acquisition costs	fitness meal plans) - Occasional one-off sales or promotions
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The integration of GenAI has the potential to significantly reshape HelloFresh's digital business model. To support this, we employ the framework introduced by Weill and Woerner (2015) to evaluate how GenAI could influence this transformation. Their theory outlines four distinct digital business models that organizations can adopt in the digital era: Supplier, Omnichannel Business, Modular Producer, and Ecosystem Driver. These models help businesses understand how they create value in a digital landscape by focusing on two key factors: the degree of control the company has over the value chain, and the level of knowledge it possesses about its end customers (Weill & Woerner, 2015).

Applying this framework to HelloFresh's current position, the company can be classified as a **Supplier**. In its current state, HelloFresh operates through a linear value chain that encompasses sourcing ingredients, packaging meal kits, and delivering them to customers. However, its interaction with customers is mostly transactional, focused on providing convenience and surface-level personalization without deep insights into each customer's evolving preferences or needs. Although HelloFresh controls parts of its supply chain, it remains largely confined to a traditional, sequential process with limited knowledge of its customers' broader health or dietary goals (*HelloFresh SE*, n.d.).

Due to digitalization and the availability of information, businesses with the Supplier model are likely to lose power and face increasing pressure to continually reduce prices, which could lead to further industry consolidation (Weill & Woerner, 2015). In this context, it is in the best interest of Suppliers to transition to more sustainable models. However, with the integration of GenAI, HelloFresh has the potential to evolve from a **Supplier** into an **Ecosystem Driver**. GenAI would enable HelloFresh to gain a much deeper understanding of

its customers by analyzing their dietary preferences, and health information, thereby locking them in and extracting consumer rent. As an **Ecosystem Driver**, HelloFresh can create a network that integrates suppliers, logistics partners, and technology providers, locking in HelloFresh's customers to its ecosystem (Iansiti & Makhani, 2021). By transitioning into this model, HelloFresh can provide a dynamic, data-driven platform that evolves continuously with its customers' needs, similar to how Amazon operates within its ecosystem (Weill & Woerner, 2015).

The transition to an Ecosystem Driver, driven by GenAI integration, has the potential to position HelloFresh as a transformative business. According to Kavadias et al. (2016), a business must excel in at least three of six key success features to achieve this status. With GenAI enabling personalized meal plans through advanced algorithms, HelloFresh meets the criteria for **personalization**. Furthermore, Kavadias' framework also emphasizes the importance of building a **collaborative ecosystem** with supply chain partners to efficiently allocate risk and cost, which is central to the Ecosystem Driver (Kavadias et al., 2016). Finally, HelloFresh's existing **closed-loop processes** - delivering pre-portioned ingredients to minimize food waste and promoting sustainability - serve as the third key to success. This combination strongly supports HelloFresh's shift to an Ecosystem Driver, positioning the company for long-term competitive advantage compared to remaining a Supplier.

3. Objectives and Goals

The integration of Generative AI (GenAI) into HelloFresh's business model is driven by several key objectives aimed at improving both customer experience and operational efficiency. Through the use of GenAI, HelloFresh aims to enhance personalization, optimize supply chain efficiency, and drive innovation. These objectives are coupled with specific, measurable goals to ensure success, such as increasing personalized meal recommendations and improving operational growth without increasing staffing as shown in Table 3. The following objectives are designed to deliver a better experience for users, while also ensuring that operations remain scalable and sustainable.

Table 3: Objectives and goals

Objective	Goal	Metrics for Success	Expected Outcome
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Enhancing customer personalisation	Increase personalized meal recommendations by 30%	Engagement rates, customer retention, Net Promoter Score (NPS)	20% improvement in customer retention, fostering long-term loyalty
Optimizing supply chain efficiency	Reduce food waste by 15%	Reductions in wasted perishable goods, operational cost savings through improved demand forecasting	10% reduction in operational costs, better alignment with sustainability goals
Driving product innovation	Increase AI-generated recipes to align with food trends	Customer selection rates for AI-generated recipes, impact on new customer acquisition	15% increase in customer acquisition within six months
Improving customer support	Reduce average response times and increase efficiency	First Contact Resolution (FCR) rates, improvements in response time and customer satisfaction post-interaction	Faster query resolution, and improved customer satisfaction through 24/7 support
Scaling operational efficiency	Achieve 20% operational growth without increasing staffing	Cost per additional customer served, time saved through automation	20% increase in operational efficiency, and effective scaling while maintaining high service standards

4. Market Analysis

To assess HelloFresh's market positioning, the first step is to identify the market in which it operates. As of 2024, HelloFresh is a key player in the meal kit delivery industry, recognized as one of the leaders in this rapidly growing sector (Statista, 2024). In this analysis, Porter's Five Forces model is employed to examine the competitive landscape and better understand the dynamics of the meal kit delivery market (Porter, 2008).

4.1. Bargaining Power of Customers - High

Porter (2008) stated that high bargaining power of customers indicates their ability to switch between providers or negotiate for better deals. In the Netherlands, meal kit buyers are particularly price-sensitive, with alternatives like supermarkets, restaurants, and food delivery services readily available. HelloFresh's subscription-based model, which allows easy cancellation or pausing of services, further empowers customers to switch without incurring significant switching costs (HelloFresh, 2024). As a result, customers hold considerable bargaining power, with the freedom to explore competitive options at little personal cost.

4.2. Bargaining Power of Suppliers - Low

Due to its large size and global network as a market leader, HelloFresh can leverage better deals than smaller competitors and will often have the option to switch suppliers. Furthermore, since supermarkets do not currently focus on sustainable options, HelloFresh has more sway over the sustainable suppliers that they claim to have (The Questionmark Foundation, 2023). Porter (2008) explains that low supplier bargaining power means suppliers must compete on price, quality, or service to maintain business relationships. With a wide variety of food suppliers available, HelloFresh benefits from the flexibility to switch partners, ensuring competitive pricing and reliable supply.

4.3. Threat of New Entrants - High

During her lecture at Erasmus University Rotterdam, Li (2024) identified three conditions that signal market vulnerability: ease of entry, attractiveness for competitors, and difficulty of defence. The meal kit delivery market has become increasingly easy to enter due to regulatory changes and relatively low start-up costs, as businesses do not require expensive technology or machinery. With established players like HelloFresh achieving high profits, the market is attractive to new entrants. New competitors can target underserved segments, potentially disrupting HelloFresh's long-standing business model. The market's growth, particularly during the COVID-19 pandemic, further underscores its appeal to new players (Statista, 2024). Moreover, incumbents may find it difficult to defend their positions due to strategic rigidity, legacy systems, and fixed pricing structures. The combination of low switching costs for customers and well-resourced new entrants makes the threat of new competitors notably high.

4.4. Threat of Substitutes - High

One of the substitutes for this market is the takeout industry, which can bypass the need for cooking altogether. These substitute options are often relatively expensive when compared to HelloFresh, which is an advantage that they should maintain in order to combat this threat. However, the main threat of substitutes in this industry is most likely to come from the supermarkets. Firstly, they do offer their own meal kits, which are often just as convenient to the customer as delivery once they are in the supermarket. These are often also presented with delivery options, such as Albert Heijns Allerhande box. Furthermore, grocery shopping in itself presents risks for HelloFresh as customers are able to get many of the ingredients provided by HelloFresh from the supermarkets themselves. Despite the convenience provided by the delivery and recipe creation of HelloFresh being a strong advantage, the threat of substitutes is also high in this industry.

4.5. Threat of Rivalry - High

The meal kit delivery market is currently highly competitive and saturated with firms, largely due to the low barriers to entry and the industry's growth potential. Although HelloFresh maintains a dominant market share of around 70% in the Netherlands, it faces increasing competition from rapidly growing players like Albert Heijn's Allerhande Box, Picnic, and Marley Spoon (Statista, 2024). These rivals are expanding their market presence by offering similar services, putting pressure on HelloFresh to continuously innovate with unique recipes and ingredients to maintain its competitive edge.

HelloFresh's global presence also exposes it to risks from competitors across multiple markets, increasing the complexity of defending its position. As competition intensifies, HelloFresh must differentiate itself from rivals not only on the product level but also through operational efficiency and customer experience.

The high level of rivalry further supports the case for integrating Generative AI into HelloFresh's strategy. By leveraging GenAI, HelloFresh can gain a competitive advantage across multiple areas, including personalized meal plans, optimized supply chain management, and innovative customer engagement. Most critically, GenAI offers an opportunity for product differentiation, which is key to maintaining customer loyalty and securing HelloFresh's position as a market leader.

5. Implementation

This section outlines the strategic and technical integration plan of GenAI into HelloFresh's current operations. The plan is developed using the four-phase AI integration framework, described in Ledro, Nosella, and Dalla Pozza's study, adapted to HelloFresh's business model (2023) with each phase describing the detailed steps that HelloFresh should implement.

5.1. Phase 1: Discovery Phase

This phase focuses on research, stakeholder awareness of cultural shifts, and the evaluation of ethical implications. The goal is to establish clear business objectives and ensure organizational readiness for AI adoption.

5.1.1. Conducting Research

The first step involves a comprehensive review of academic literature to gather insights on Generative AI integration, consumer dynamics, and customer retention in the food industry. With consumers increasingly becoming central to digital platforms, HelloFresh will also collect data from customer reviews on social media platforms such as Reddit, Facebook, and Google Reviews (Hennig-Thurau et al., 2004). This will provide valuable insights into customer preferences, concerns, and expectations regarding HelloFresh's current offerings. These insights will be used to develop a targeted marketing strategy, ensuring efficient resource allocation and avoiding unnecessary spending on ineffective campaigns. Additionally, employees will be surveyed to assess their expectations regarding the transformation and its potential impact on their roles. Based on these survey results, HelloFresh will develop an internal training program.

5.1.2. Predicting Scenarios after AI Integration

To ensure a comprehensive and structured approach to AI implementation, helping HelloFresh maximize the benefits of AI while maintaining control and alignment with overall business objectives, we propose using the AI Canvas (Agrawal et al., 2021). The AI Canvases for meal recommendation systems and supply chain management are represented in Table 4 and Table 5, respectively.

Table 4: The AI Canvas: Using AI in HelloFresh Meal Recommendation System

Prediction Predict customer preferences for meals based on past behaviours, nutrition needs and health information.	Judgement Compare the AI's recommended meals against customer satisfaction feedback to determine if recommendations align with preferences.	Action Recommend personalized meal plans on the app or website for users to select and customize.	Outcome Observe whether customer satisfaction increases with the recommended meals and if purchase frequency increases.
Input Customer order history, dietary preferences, health data (e.g., allergies, fitness goals), and behavior patterns.	Training Use historical customer data on meal selections and satisfaction to train the AI recommendation model.	Feedback Collect feedback from customers on meal satisfaction, adjust recommendations accordingly, and retrain the model as needed.	

Table 5: The AI Canvas: Using AI in HelloFresh Supply Chain

Prediction Predict future demand for ingredients and predict potential supply chain disruptions based on historical data.	Judgement Compare AI-generated forecasts with actual inventory usage and sales to ensure predictions align with real-world outcomes.	Action Adjust supplier orders, manage stock levels, and allocate resources based on AI predictions to optimize the supply chain.	Outcome Evaluate if operational efficiency improves, food waste decreases, and supply chain costs are reduced.
Input Supplier data, inventory levels, delivery timelines, historical demand patterns, and market trends.	Training Train the AI model using historical demand data and supply chain performance metrics.	Feedback Collect real-time supply chain data, adjust forecasts, and update the model to improve accuracy and performance.	

GenAI allows enterprises to make predictions better, faster and cheaper (Agrawal et al., 2021). It simplifies the process of filtering and sorting to find insights from an enormous dataset. While the AI Canvas is a simple tool that helps you organize what you need to know into seven categories in order to systematically make that assessment. The AI Canvases

provide HelloFresh's managers with a broader overview of what GenAI can predict and do based on their inputs. Therefore, they can adjust their strategies to achieve their targets.

5.1.3. Ensuring Stakeholder Awareness of Cultural Shift

Technological transformations can reshape an organization's culture and alter employee roles, often causing uncertainty (Delaney & D'Agostino, 2015). To address this, HelloFresh should prioritize transparent communication to keep all employees informed and aligned with the transition. Regular updates through company-wide meetings and emails can detail progress and upcoming changes. Additionally, by conducting weekly one-on-one discussions, managers can provide personalized guidance to employees on how the transition will affect their specific roles.

5.1.4. Evaluating Ethical Implications

Due to HelloFresh's operations in Europe, classifying AI-driven solutions according to their risk levels is a requirement stipulated by the EU AI Act (European Commission, 2023). According to the EU AI Act (2023), systems that provide AI-generated recipe suggestions are classified as the minimal risk, as they pose low regulatory concerns and do not infringe upon individuals' fundamental rights or safety. In contrast, systems that personalize meal recommendations based on dietary preferences, budget constraints, and demand forecasting are categorized as limited risk. These systems involve a moderate level of regulatory oversight due to their potential impact on user choices. Lastly, systems that provide health-related meal recommendations are classified as high risk, as they directly affect individuals' health and well-being, necessitating stricter ethical considerations and compliance measures.

5.2. Phase 2: Devise Phase

The Devise Phase focuses on establishing the technical AI capabilities and infrastructure necessary to align with HelloFresh's business requirements, ensuring the delivery of immediate value.

5.2.1. Identifying IT Capabilities

It is necessary to assess HelloFresh's IT capabilities before designing IT solutions to prevent implementation failure. Given its extensive global operations, characterized by over

840 entities, HelloFresh qualifies as a large enterprise according to the European Union's definition (Eurostat, 2024). To facilitate this assessment, we employ the TOGAF framework, which consists of eight phases that can be modified to the specific needs of the organization. Utilizing this framework will enable HelloFresh to align its IT systems with business objectives, optimize resource management, and ensure that its IT architecture is scalable, flexible, and secure.

5.2.2. Developing GenAI Solution

HelloFresh's existing business model primarily generates meal suggestions for groups rather than individuals. While customers can select their preferred recipes, the choices are somewhat restricted and may not always reflect individual preferences, limiting consumer creativity. To address this challenge, the development of an AI-driven recommender system (chatbot) is proposed. This system will generate personalized recipes based on users' favourite ingredients, existing food allergies, health conditions, nutritional requirements, and selected item descriptions.

According to Tran et al. (2018), food recommender systems can be classified into four distinct types. The first type focuses on user preferences, customizing recommendations based on individual tastes and choices. The second type addresses the nutritional needs of users, ensuring that the suggested meals align with specific dietary requirements. The third type strikes a balance between user preferences and nutritional needs, providing recommendations that consider both personal tastes and health-related factors. Finally, the fourth type is designed for group recommendations, catering to the collective preferences and dietary considerations of multiple users.

After collecting user data, GenAI will filter the necessary information and synchronize it across the supply chain. This process updates the number of orders, inventory levels, and expected delivery times automatically, without the need for human intervention. Furthermore, customer, order, and inventory data should be centralized to establish a cohesive system that provides GenAI with access to substantial datasets for training and predictive modelling.

5.3. Phase 3: Deploy Phase

The Deploy Phase concentrates on the comprehensive implementation of Generative AI solutions in the production environment, aimed at enhancing customer service and optimizing supply chain operations.

5.3.1. GenAI-integrated Recommendation System

We will implement a food recommender system in the form of a chatbot, serving as a virtual assistant to provide meal kit suggestions based on user input and the availability of ingredients. If users attempt to modify meal suggestions in a manner that conflicts with their health requirements, they will receive a warning before making any decisions.

To effectively assess the performance of the chatbot, HelloFresh will utilize several key metrics. We propose measuring accuracy, response time, conversation coherence, and user engagement to evaluate the effectiveness of the recommendation system (Kasaraneni, 2022). The accuracy metric gauges the chatbot's ability to correctly interpret and respond to queries, while the response time metric assesses the speed of the chatbot's replies (Kasaraneni, 2022). Additionally, the conversation coherence metric evaluates the chatbot's capability to maintain logical dialogues over multiple exchanges (Kasaraneni, 2022).

5.3.2. Supply Chain Optimization

HelloFresh will leverage Generative AI for comprehensive supply chain management, encompassing demand forecasting, inventory optimization, and route planning. A platform will be established to monitor real-time inventories, deliveries, and anticipated demand and supply. This platform will utilize Application Programming Interfaces (APIs) from third-party providers, such as Buitenradar for weather tracking and TomTom for traffic monitoring, to accurately predict delivery durations.

While various metrics can be employed to measure supply chain performance, we will focus on three primary metrics derived from the study by Gunasekaran, Patel, and McGaughey (2004): order lead time, supplier delivery performance, and capacity utilization. The calculations and purposes for these three metrics will be detailed in Table 7.

Table 7: Supply Chain Performance Metrics

Metrics	Calculations	Purpose
Order Lead Time	Order Lead Time = Delivery Date - Order Placement Date	Measures the time taken from order placement to delivery.
Supplier Delivery Performance	Supplier Delivery Performance = (Number of On-Time Deliveries / Total Deliveries) * 100	Evaluates how reliably suppliers meet delivery schedules.
Capacity Utilization	Capacity Utilization = (Actual Output / Maximum Possible Output) * 100	Assesses the efficiency of resource usage in production.

5.4. Phase 4: Sustain Phase

In the final phase, HelloFresh concentrates on monitoring and refining its AI tools to ensure they remain relevant and valuable over time (Ledro et al., 2023).

5.4.1. Fostering User Adoption

To encourage user adoption, comprehensive training and educational resources will be provided. For internal employees, a mix of interactive tutorials, hands-on workshops, and webinars will gradually familiarize them with the changes. All training materials will be documented, enabling employees to navigate the system efficiently. For external users—HelloFresh’s customers—ongoing support will be available through a help desk or customer service team, ensuring users have access to assistance for any issues or questions. Additionally, a comprehensive knowledge base or FAQ section will be accessible on the website for self-service learning.

5.4.2. Conducting Routine System Audits

HelloFresh will engage third-party organizations to conduct audits of its data handling practices and performance against established Key Performance Indicators (KPIs). These audits should be conducted quarterly as HelloFresh's AI systems handle highly sensitive data, including the medical information of its users. Such audits are mandatory to verify that the Generative AI system manages data responsibly and that privacy measures are consistently maintained. Regular audits not only help avoid fines for non-compliance but also reinforce customer trust by ensuring that data is stored and processed securely.

6. Benefits Evaluation

The following section outlines the positive impacts of integrating GenAI, associated with transaction costs, user data and competitive advantage.

6.1. Transaction Costs Reduction

The introduction of GenAI to HelloFresh's business can reduce transaction costs. According to Dahlman (1979), transaction costs involve search and information costs and bargaining costs. With the deployment of GenAI in supply chain management, HelloFresh can select the best ingredients from the best suppliers with the lowest price, which refers to the search and information costs. In addition, HelloFresh can draw the best contract in the best condition with the best suppliers, lowering suppliers' bargaining powers and thereby decreasing the bargaining costs (Dahlman, 1979).

6.2. Data Monetization

HelloFresh can monetize its data to improve internal business procedures and decisions (Zhang et al., 2023). The data collected from user behaviours can be used towards decision-making, for example, HelloFresh can better anticipate which ingredients tend to be rejected or avoided by users during conversations with the chatbot. The utility of this information can bring economic benefits such as the detection of inconsistencies and fraud or decision support, cost reduction, increase in productivity and sales (Baecker et al., 2020).

6.3. Competitive Advantage

An obvious benefit of the GenAI implementation for HelloFresh is to enhance HelloFresh's competitive advantage (Chatterjee et al., 2021). HelloFresh can capture the value from its customers, suppliers and even internal employees, and thereby provide better service offerings. In the long term, HelloFresh can utilize this information to target a new customer segment and expand its market share in this competitive industry.

7. Risk Analysis

Due to the scope of the project, the solutions might not be perfectly developed after deployment; hence, it is important to consider the potential risks involved. In the following sections, we will explore key challenges associated with AI-powered recommendations, including customer acceptance, algorithmic biases and technical complexity.

7.1. Customer Acceptance and Engagement

Although the idea of personalized meal suggestions based on individual preferences and health conditions sounds promising, there is a probability that the GenAI system might not fully capture the nuances of customer behaviour. The customers might not engage with the system more frequently or make additional purchases as we expected if the recommendations do not align with their actual needs or preferences. In addition, inaccurate or irrelevant suggestions could result in customers feeling disconnected from the platform, reducing the likelihood of repeat purchases (Luo et al., 2019).

7.2. Algorithm Bias: Inaccurate Predictions and Recommendations

GenAI systems rely on data to make predictions and recommendations. When the recommendations are biased, consumers will struggle to adjust the recipes to their own preferences, resulting in fewer purchases (Banker & Khetani, 2019). Similarly, biases in algorithms lead to inaccurate demand forecasting in the supply chain, such as overstocking or understocking ingredients (Ma, 2024). In the long run, this can slow down revenue growth by impacting order fulfilment and customer satisfaction.

7.3. Technical Complexity

The high implementation costs, including technology, infrastructure, and training for integrating GenAI into the supply chain could strain resources before realizing any financial benefits. The technical complexity of AI systems often necessitates highly specialized skills for maintenance and updates, potentially limiting their adoption by HelloFresh's suppliers (Ding et al, 2023). When combined with traditional methods, production processes might face disruptions or lack coordination due to technological differences.

8. Recommendations

If not properly addressed, the risks can impact customer satisfaction, engagement, and overall business performance. The GenAI model requires regular monitoring and updating with current data to ensure ethical and responsible models (Ma, 2024). This practice will help sustain the model's accuracy in understanding customers' dietary preferences and predicting emerging trends. Additionally, being trained with large and diverse datasets will enable the model to address various queries and scenarios more effectively.

Secondly, actively gathering user feedback is crucial for system improvement. Implementing post-interaction surveys and analysing customer behaviour can reveal areas needing enhancement. Insights from user feedback can refine the meal suggestion generation process and identify gaps between customer expectations and actual offerings.

Before integrating the GenAI meal recommendation system, it is imperative to conduct a thorough investigation into customer demands. This assessment will clarify which features customers desire and which may incur unnecessary development costs. Furthermore, training the Large Language Model (LLM) to align with HelloFresh's values, particularly concerning sustainability and affordability, should be a primary focus. The objective is to ensure that the service provides superior options compared to existing open-source LLMs.

Finally, detailed guidelines must be established to address technical difficulties during the integration with external suppliers. Technical requirements should be written in simple, clear language that everyone involved can easily understand. This ensures that all stakeholders can follow and interpret the information accurately.

9. Conclusion

In conclusion, the integration of Generative AI (GenAI) into HelloFresh's business model represents a strategic imperative to enhance customer experiences and drive operational efficiencies in a rapidly evolving market. As consumer preferences shift towards greater customisation and convenience, HelloFresh must leverage advanced technologies to maintain its competitive edge and adapt to the dynamic food industry landscape.

This project has several limitations: First, we do not have access to HelloFresh's customers, which limits generalizability. Second, our solutions are primarily theory-based, concepts used in the projects might not cover all the aspects of the practical world.

While the challenges posed by less customer engagement, potential algorithm biases, and technical difficulty cannot be underestimated, proactive risk management strategies and a commitment to continuous improvement will be essential for successful implementation. Ultimately, by aligning GenAI with its core values of sustainability and affordability, HelloFresh can enhance its market position and ensure long-term success in the competitive meal kit delivery sector. This strategic shift will enable HelloFresh to better meet the evolving needs of its customers and solidify its status as a leader in the industry.

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