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Mitigating the liability of foreignness in factory-direct e-commerce business

Artificial intelligence capabilities as shaping factors of business

International Business

Bachelor's thesis

Turku School of Economics

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Student’s statement regarding the use of Artificial Intelligence (AI) for preparing and/or writing this thesis:

☐ **I have not used any AI-based tools.**

☒ **I have used AI-based tools**. Their use is documented in the Appendix. The AI tools were used in a way that complies with academic integrity guidelines.

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Abstract

This thesis examines how liability of foreignness (LOF) and artificial intelligence (AI) capabilities jointly shape early-stage direct-to-customer (D2C) e-commerce businesses. The thesis is motivated by the growing number of manufacturers and entrepreneurs adopting e-commerce-based D2C models that bypass traditional intermediaries and warehousing. While such approaches enable fast, low-commitment internationalization, they also expose firms to external frictions related to foreignness, distance, and operational reliability.

The thesis analyses how the mechanisms of LOF emerge in cross-border D2C operations and how these institutional and cultural distances affect essential economic outcomes. In this context, LOF appears as higher marketing and customer-acquisition costs, weaker sales conversion, and thinner early profit margins due to limited local legitimacy and operational reliability. The thesis then explores how AI-based capabilities, already integrated into marketing, payment, and logistics platforms, can mitigate these disadvantages. Such tools support localization, detect and prevent fraudulent transactions, personalize communication for unfamiliar audiences, and predict delivery performance, which helps to rebuild trust and improve efficiency in early-stage international e-commerce business.

Methodologically, the thesis is conceptual, and literature driven. It combines classical international business theories, including the liability of foreignness, institutional and cultural distance, and dynamic capabilities. With recent empirical research on e-commerce and AI applications in factors like marketing, fraud analytics, and logistics optimization. This integration leads to an analytical framework that links LOF-related frictions to digital interventions, illustrating how firms can use AI to reduce uncertainty, strengthen legitimacy, and enhance early business performance when expanding abroad.

The findings suggest that although factory-direct D2C models offer scalability and data-driven learning advantages, their success in international markets depends on the firm’s ability to manage the disadvantages of foreignness through AI-supported adaptation and control. Predictive and generative AI systems can help firms spend early-stage budgets more efficiently, increase the share of website visitors who complete purchases, reduce losses from fraud and product returns, and improve delivery accuracy. By demonstrating these mechanisms, the thesis contributes to both international business and digital commerce research and provides practical guidance for manufacturers and entrepreneurs aiming to build globally viable, AI-enabled D2C businesses.

Keywords: Direct-to-customer (D2C), e-commerce, liability of foreignness (LOF), artificial intelligence (AI).

Kandidaatintutkielma

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Tiivistelmä

Tämä tutkielma tarkastelee, miten ulkomaalaisuusrasite ja tekoälykyvykkyydet yhdessä muokkaavat varhaisen vaiheen **s**uoraan kuluttajalle -verkkokauppaliiketoimintaa. Tutkimuksen taustalla on valmistajien ja yrittäjien kasvava kiinnostus hyödyntää kyseisiä verkkokauppaliiketoimintamalleja, jotka mahdollistavat tuotteiden myynnin suoraan verkossa ilman perinteisiä välikäsiä tai varastointia. Vaikka tällainen tarjoaa nopean ja kevyen tavan kansainvälistyä, se altistaa yritykset samanaikaisesti ulkomaalaisuudesta, etäisyydestä ja operatiivisesta luotettavuudesta johtuvalle kitkalle ja lisäkustannuksille.

Tutkielmassa analysoidaan, miten ulkomaalaisuusrasitteen mekanismit ilmenevät rajat ylittävässä suoratoimite liiketoiminnassa, sekä miten institutionaaliset ja kulttuuriset etäisyydet vaikuttavat keskeisiin taloudellisiin tekijöihin. Ulkomaalaisuusrasite näkyy erityisesti esimerkiksi kasvaneina markkinointi- ja asiakashankintakustannuksina, heikompana myynnin konversiona sekä kapeampina katteina, johtuen rajallisesta paikallisesta legitimiteetistä ja toiminnan luotettavuudesta. Tutkielmassa tarkastellaan lisäksi, miten tekoälypohjaiset kyvykkyydet, joita on jo sisällytetty markkinointi-, maksuliikenne- ja logistiikkajärjestelmiin, voivat lieventää näitä haittoja. Tällaiset kyvykkyydet tukevat tuotteiden ja palveluiden lokalisointia, havaitsevat ja estävät petoksia, personoivat viestintää uusille kohdemarkkinoille ja ennustavat toimitusten onnistumista. Auttaen näin rakentamaan luottamusta ja parantamaan tehokkuutta kansainvälisen verkkokaupan alkuvaiheessa.

Menetelmällisesti tutkielma yhdistää klassisia kansainvälisen liiketoiminnan teorioita, kuten ulkomaalaisuusrasitteen, institutionaalisen ja kulttuurisen etäisyyden sekä dynaamisten kyvykkyyksien teoriat, ajankohtaiseen tutkimukseen verkkokaupasta ja tekoälyn soveltamisesta markkinoinnin, petosriskien ja logistiikan optimoinnin alueilla. Tämän pohjalta muodostetaan analyyttinen viitekehys, joka yhdistää rasitteisiin liittyvät kitkatekijät digitaalisiin interventioihin havainnollistaen, miten tekoälyn avulla yritykset voivat vähentää epävarmuutta, vahvistaa legitimiteettiä ja parantaa liiketoiminnan alkuvaiheen suorituskykyä kansainvälistyessään.

Tutkimustulokset osoittavat, että vaikka tehdassuorat liiketoimintamallit tarjoavat skaalautuvuutta ja datalähtöistä oppimiskykyä, niiden kansainvälinen menestys riippuu yrityksen kyvystä hallita ulkomaalaisuusrasitteen haittavaikutuksia tekoälyn tukemien prosessien avulla. Ennustavat ja generatiiviset tekoälyratkaisut auttavat yrityksiä hyödyntämään budjettiaan tehokkaammin ja lisäämään ostotapahtuman suorittavien asiakkaiden osuutta verkkokaupassa. Tämän lisäksi ne auttavat vähentämään petoksista ja palautuksista aiheutuvia tappioita sekä parantaa toimitusten täsmällisyyttä. Näiden mekanismien esittämisen kautta tutkielma yhdistää kansainvälisen liiketoiminnan teorian ja digitaalisen liiketoiminnan käytännöt, tarjoten sekä teoreettista että käytännönläheistä ohjausta valmistajille ja yrittäjille, jotka tavoittelevat globaalisti kilpailukykyistä ja tekoälyn mahdollistamaa verkkokauppaliiketoimintaa.

Avainsanat: Suoramyyntiliiketoiminta, verkkokauppa, ulkomaalaisuusrasite, tekoäly.

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1 Introduction

1.1 Background and motivation

Direct-to-consumer (D2C) commerce has moved from a niche experiment to a mainstream option for manufacturers and entrepreneurs. A factory-direct, no-inventory e-commerce setup promises speed, global reach, and direct customer access (McKee et al. 2025, 1–2). The key appeal and advantage of D2C e-commerce is that it runs without the sunk costs of traditional retail, regional warehousing or third-party distributors (Ballerini et al. 2024, 5). In D2C model, the company sells directly to end customers through its own online storefront (e.g. platforms like, Shopify) and fulfils orders directly from the manufacturer or upstream partner, without holding local stock in regional warehouses. In todays interconnected world, many firms and entrepreneurs want to test this kind of business e-commerce model, because it is easily accessible for all (McKee et al. 2025, 1–3). It allows firms to test demand in new countries and markets without first committing to physical retail or local inventory. However, many of businesses in the sector often fight against lack of knowledge or they just do not know all the factors that should be noted, causing a major problems and challenges including liability of foreignness (LOF), at the early stage of business. (Ballerini et al., 2024, 5–6)

For international launches, D2C is one of the lowest-commitment way for many firms and entrepreneurs to test demand and markets globally. The reason is that an e-commerce firm launch digitally, ship cross-border, and learn from real buyers before it invests in local presence. (Ballerini et al. 2024, 5–7) At the same time, the same lean structure that makes D2C e-commerce business attractive also makes it fragile. Especially in the first months of expansion, there are few buffers. Buffers might come up with change in acquisition costs, approval rates, conversion rates or high product returns, which can determine whether the business model scales or collapses (Ballerini et al., 2024, 426–434). This fragility becomes more severe the moment the firm starts selling across borders. Once a firm is a foreign seller, it is no longer only doing e-commerce. At that moment it is doing international business. And international business usually comes with frictions. (Ballerini et al. 2024, 4–6).

In international business research, these frictions are described through the concept of the liability of foreignness (LOF). The thesis examines liability of foreignness, which refers to the additional costs, risks and legitimacy challenges that firms face when operating outside their home country/market due to differences in unfamiliarity. This unfamiliarity regards culture, institutions,

lack of embeddedness or trust, and distance from familiar environments (Zaheer, 2015, 5–7; Nachum 2015, 1–3). In the context of D2C e-commerce, these same mechanisms appear in digital form. When a company sells directly to consumers across borders without intermediaries or local stock, it still encounters digital distance. Customers may hesitate to purchase from an unfamiliar foreign brand, or payment processors and customs systems may treat transactions as higher risk (Ballerini et al. 2024, 4–8). These small operational problems can quickly damage whole credibility of the firm (Ballerini et al., 2024, 426–428). As a result, liability of foreignness directly undermines the firms in early-stage performance. In other words: when running a D2C e-commerce business internationally, firm does not just have a logistics challenge. Firm also has a legitimacy challenge. (Zaheer, 2015, 7–8; Nachum 2015, 1–3)

This is exactly where the current literature has concentrated. Recent D2C research mainly maps channel choices (selling via marketplaces vs. selling through your own channel) and discusses how brands and manufacturers are increasingly pressured to own the relationship with the end customer (McKee et al. 2025, 1–5). At the same time, work on manufacturers' e-commerce expansion points out very practical tensions. When a manufacturer runs its own direct channel alongside other channels, it must coordinate fulfilment, returns, customer service, and messaging coherently (Ballerini et al., 2024, 426–431). Together with that coordination becomes harder across borders, partners, and service expectations (Ballerini et al. 2024, 4–7). This is not just an operational problem. It is a strategic constraint; if firm cannot promise reliability, it cannot build trust. If firm cannot build trust, it basically pays more to acquire every customer and convert fewer of them. (McKee et al. 2025, 1–2; Ballerini et al. 2024, 426–428)

LOF causes challenges for foreign firms and makes them pay a penalty because of it. Motivation in this thesis builds up from mitigating LOF, especially with artificial intelligence (AI) capabilities. Mitigating LOF, means the reduction of harmful and unpleasant liability of foreignness factors that business is facing abroad (McKee et al. 2025, 1–2; Zaheer 2015, 4–7). Targeted AI applications as mitigation tool influence early-stage e-commerce business. To measure the effectiveness of these AI applications in overcoming LOF, specific performance metrics must be tracked. Factors and metrics like these are, customer acquisition cost (CAC), which refers to the total marketing and sales expenses a company incurs to acquire a single new paying customer (Adjust, 2025). Second metric is contribution margin 1 (CM1) meaning a gross profit after subtracting direct variable costs from sales revenue of the business (Munich Business School, 2025). Also, metrics like conversion rate (CVR) is crucial, because it gives statistical data of visitors who completed desired action, such as making a purchase, out of all website visitors. Firms should keep an eye on these metrics,

especially when setting on D2C business to e-commerce platform. D2C research highlights that going direct to new markets introduces executional complexity for manufacturers and young brands, but it does not fully explain how LOF appears in D2C e-commerce. Especially in the first months of entry, i.e. at the stage where firms' survival is binary, foreignness translates into commercial pressure in metrics like CAC, CVR, CM1. (McKee et al. 2025, 1–11; Ballerini et al. 2024, 414–427)

The central question of thesis is whether the performance disadvantages associated with liability of foreignness can be systematically mitigated without the significant cost of establishing a physical presence abroad. This is where artificial intelligence (AI) becomes relevant, because AI-enabled capabilities are now embedded directly into marketing platforms, storefront tooling, payments infrastructure, and logistics stacks (Nachum 2015, 1–3). These capabilities allow even a very small market entrants to execute retail business, which traditionally required a local team. Things like, dynamically localize content and language, personalize recommendations to unfamiliar audiences, screen transactions for fraud with high precision while keeping approval rates high, predict delivery times more accurately across borders, and guides to reduce returns. Research suggests that these AI mechanisms can compensate for exactly the disadvantages that LOF creates in a foreign market: lack of trust, perceived risk, uncertainty about fulfilment, and fear of being scammed or disappointed (Huang & Rust 2021, 30–33; Shankar et al. 2021, 13-14; Angelbratt 2025, 6–8; Global eCommerce Payments & Fraud Report 2024, 3).

1.2 The aim and purpose of this thesis

The aim and purpose of this thesis are to explore LOF and AI capabilities together influencing the performance of the factory-direct, D2C e-commerce business. The thesis seeks to deepen the understanding of how classical international business frictions, such as cultural, institutional, and geographic distances, continue to shape digital trade, in situation where firms operate through online platforms instead of physical market presence. Although the D2C model enables manufacturers to reach global consumers directly without intermediaries or local warehouses, it simultaneously exposes them to disadvantages related to foreignness, legitimacy, and local embeddedness. These challenges manifest in early cross-border D2C businesses and AI-based tools can help firms mitigate them. The main research question of this thesis is:

- How can AI capabilities help D2C e-commerce businesses overcome liability of foreignness?

To answer this question, the thesis is structured around two interrelated sub-research questions:

- How does the liability of foreignness manifest in early-stage D2C internationalization?
- Which AI-enabled capabilities can mitigate the key challenges created by LOF in cross-border D2C?

Together, these questions enable the thesis to bridge theory with digital business practice. The first sub-question identifies how institutional and cultural distances affect trust, compliance, and operational reliability in D2C contexts. The second question examines how AI tools, such as personalization systems, predictive analytics, and fraud-control mechanisms, reduce uncertainty and enhance local legitimacy.

The thesis is therefore twofold. First, it contributes to international business research by extending the discussion of the liability of foreignness into the context of digital and factory-direct e-commerce. Second, it provides insights for early-stage D2C entrepreneurs and manufacturers to design internationally viable strategies by leveraging AI-capabilities for supported localization, trust building, and operational intelligence. Through this dual focus, the thesis connects theoretical understanding with actionable guidance, showing how digitally enabled firms can overcome the liabilities of foreignness and sustain competitive performance in international e-commerce markets. Consequently, mitigating these foreignness-related frictions has become a central managerial challenge, one that emerging AI tools may increasingly address.

2 Liability of foreignness and artificial intelligence in e-commerce

2.1 The impact of foreignness on early-stage e-commerce business

This section synthesizes research explaining the most important drivers of early-stage e-commerce business in the D2C model. The concept of liability of foreignness (LOF) describes the additional costs and disadvantages, risks, and legitimacy challenges that firms face when operating outside their home country due to their foreign status and lack of local embeddedness (Zaheer, 1995). Legitimacy challenges are generally arising from unfamiliarity, discrimination, and spatial distance (Eden & Miller 2004, 187–189). These liabilities manifest as regulatory barriers, information asymmetries, and higher coordination expenses when managing cross-border operations (Chen et al 2022, 1–3). Local firms enjoy an inherent legitimacy advantage in their home markets, while foreign entrants must invest extra resources to even have a change to achieve the same level of trust and efficiency. (Zaheer 2015, 3–9)

Crucially, LOF is both an economic and a social burden. Foreign firms not only incur higher operating costs, but also suffer disadvantages in credibility, network relationships, and understanding of host-country norms. Early-stage business ventures are especially vulnerable, lacking an established reputation or local partner, they face double burden of newness and foreignness. In the D2C e-commerce context, this means a young firm expanding abroad must overcome scepticism about its legitimacy and reliability before it can effectively compete with domestic incumbents. (Lu & Beamish 2001, 565–572; Eden & Miller 2004, 187–193)

LOF is not only a financial burden for the company, because it is also a legitimacy challenge that shapes strategic choices in internationalization. Legitimacy challenge comes up easier especially with early-stage firms conducting their market entries. Zaheer (1995 343–348.) emphasized that firms abroad face not only additional costs of doing business, but also social and institutional disadvantages stemming from their foreign status. In a D2C e-commerce business, these LOF frictions (e.g. disadvantages, extra costs and operational difficulties) assume novel forms because business is conducted digitally. Because the D2C firm sells directly to international consumers through an online storefront and fulfils orders from a centralized foreign location, it remains an outsider to each local market despite the lack of physical presence. Being an outsider exposes D2C firms to challenges. Challenges include the lack of host-country legitimacy, unfamiliarity with local norms, and absence of trusted relationships (Lee et al. 2023, 2–5). As a result, LOF functions in these cases both as an economic and a social barrier. New entrant companies must first prove that

they are credible, compliant, and responsive parties of the host market before customers, regulators, or payment intermediaries treat them equally. This gets highlighted, with e-commerce businesses, because they operate digital business sector, and not as a brick-and-mortar business. (Zaheer 2015, 6–13)

In practical terms, LOF in this context translates into measurable performance penalties like, higher customer acquisition costs (CAC) due to the need for extra marketing and discounts to persuade cautious customers, lower conversion rates (CVR) as website visitors drop off without purchasing, and thinner contribution margins (CM1) caused by added costs (e.g. fraud losses, returns, export fees). Firms also face higher product return rates stemming from unmet expectations or service issues. In other words, when a fledgling factory-direct D2C venture enters a foreign market, it faces more than just operational logistics challenges, it faces a fundamental legitimacy challenge that can undermine its key metrics of early success. If a cross-border D2C firm cannot establish reliability and trustworthiness quickly, it will incur a penalty in every customer interaction: each customer will be costlier to acquire and harder to retain, putting the survival of the venture at risk. (Eden & Miller 2004, 196–200; Visa, 2025; Zaheer 1995, 343–347)

Eden & Miller (2004, 189–193) expand this view well by linking legitimacy directly to institutional distance in rules, laws, regulations and cognitive expectations between home and host environments. They note that when such distance is high, firms often compensate by adopting entry configurations that borrow local credibility, such as partnerships, joint control, or hybrid governance. In early-stage e-commerce ventures, this logic translates to legitimacy-building actions rather than ownership choices. For instance, offering local-language support, displaying transparent return policies, or using regionally trusted payment systems to reduce perceived foreignness signals legitimacy, which is essential for improving early key metrics. Metrics like conversion rate and payment approval rate are otherwise depressed by consumer uncertainty. (Eden & Miller 2004, 189–193; Zaheer 2015, 6–7)

This legitimacy dimension is particularly critical for young and early-stage firms, which lack established reputation and local embeddedness. The smaller and newer the entrant, the fewer symbolic and relational assets it possesses to offset LOF (Meyer & Thein 2014, 156–158; Zaheer 2015, 6–7). Without prior host-country experience or brand familiarity, these firms suffer burden of newness and foreignness. Managing legitimacy is not peripheral, it is a strategic condition that determines whether a cross-border D2C entry survives its early stage (Lu & Beamish 2001, 565–568). For digital and e-commerce ventures, institutional distance may materialize in differing data-

protection laws, consumer-protection rules, or payment systems. These are the factors directly affecting operational scalability and risk. If the risks are being ignored and not taken a closer look at, those can easily backlash for the business. (Eden & Miller 2004, 187–205; Zaheer 2015, 31–34)

Contemporary scholarship has also extended LOF theory regarding the digital and born-global domains. Researchers have observed that firms relying on digital platforms or data-driven operations experience a different form of foreignness. Which is basically a less physical but still institutional and relational factor (Shao, 2024). In online D2C models, LOF manifests through intangible barriers such as algorithmic bias, consumer trust deficits, and cross-border cybersecurity concerns (Chen et al 2022, 1–3). Digital connectivity reduces geographic distance but does not eliminate cultural or institutional frictions. Instead, firms must cultivate digital legitimacy by adapting communication, service quality, and data practices to local expectations (Tige 2019, 5–8). This demonstrates how LOF continues to apply in digitally mediated internationalization, where AI, data analytics, and platform governance replace traditional intermediaries but not the need for local legitimacy.

Classic international business research provides various frameworks to analyse these challenges and distances (Eden & Miller 2004, 187–189). Among these, Ghemawat's (2001) CAGE framework is particularly useful in this context because it systematically operationalizes and categorizes the distances that drive LOF, into four distinct categories. CAGE breaks down cross-national distance into four dimensions: Cultural, Administrative (Institutional), Geographic, and Economic. Each dimension highlights a different source of friction. Cultural distance encompasses differences in language, norms, values, and customer behaviour that can impede communication and trust. Administrative distance covers divergences in laws, regulations, and business practices (including payment systems and legal frameworks) that complicate compliance and transactions. Geographic distance reflects physical separation, affecting shipping logistics, delivery times, and service reliability across borders. Economic distance involves disparities in consumer purchasing power, price levels, and product valuation between home and host markets. These distance dimensions are summarized in Table 1, which outlines the key distances in each category. (Ghemawat's 2001, 1–11; Chen et al.2022, 1–3; Meyer, 2023, 1170–1174; Tige 2019, 5–8).

Cross-national distances continue to affect e-commerce performance despite the global reach of the internet. Online purchases still occur more frequently between countries that share cultural affinities or geographic proximity (Kim et al. 2017, 186–187). For instance, cultural and linguistic closeness has been found to increase trust and transaction success in cross-border online markets,

while greater geographic distance tends to dampen the volume and satisfaction of such transactions (Lee et al. 2023, 1–6). Lee et al. (2023) and Kim et al. (2017) both highlight that even in virtual marketplaces, traditional distance factors like shared language or region significantly predict e-commerce trade intensity. This suggests that D2C firms must actively account for institutional and cultural differences in their digital market entry strategies. Simply being online is not enough to overcome foreignness. As Meyer (2023) emphasizes, companies need to integrate local norms and expectations into their digital operations if they hope to establish legitimacy and sustainable traction abroad. In sum, the liability of foreignness remains highly relevant in the digital era: it still raises uncertainty and transaction costs for foreign sellers, requiring strategic adaptation even when no physical storefronts are involved. (Grewal et al. 2017, 1–5; Kim et al. 2027, 184–186; Meyer 2023, 1170–1174)

Table 1 The CAGE framework distances (adapted from Ghemawat 2001, 1; EBSCO, 2025; created with the assistance of Google Gemini)

Distances to consider			
Cultural	Administrative	Geographic	Economic
Language	Bureaucracy	Size	Economic model
Religion	Regional models	Nearby Countries	Currency
Values	Politics	Location	Growth
Social models	Laws	Orography	GDP per capita
Norms	Regulations	Political Borders	

Although selling through online channels reduces some physical barriers to entry, digital e-commerce does not eliminate CAGE-related frictions, because it often merely transforms them (Ghemawat 2001, 1–4). For example, a language gap can translate into lower click-through rates on ads and a confusing website experience; differing financial regulations or currency controls can introduce payment friction; long international shipping routes create uncertainty around delivery; and differences in income or consumer preferences can make pricing a foreign product correctly a nontrivial challenge (Lee et al. 2023, 1–3; Kim et al. 2017, 185–187). Understanding these multidimensional frictions provides the base for examining, in Section 2.2, how AI capabilities can act as targeted mitigants across each dimension.

2.2 Dimensions of liability of foreignness in e-commerce

Overall, the LOF framework provides a multi-dimensional lens to diagnose the challenges faced by early-stage D2C e-commerce ventures abroad. It connects classical distance theory (CAGE) with institutional legitimacy perspectives, and recent insights on political and digital contexts (EBSCO, 2021). For a D2C e-commerce firm, LOF pressures translate into concrete obstacles in customer acquisition, payment processing, fulfillment logistics, and trust-building across borders (Chen et al 2022, 1–3). Table 2 summarizes five key categories of LOF-related frictions especially pertinent to a factory-direct D2C model: (1) Unfamiliarity and trust deficits, where foreign brands are perceived as unknown, risky or less trusted, leading to lower conversion and higher CAC; (2) Administrative and payment frictions, which involve cross-border transactions being flagged for fraud, resulting lower payment approval rates and chargeback risks; (3) Cultural and language distance, where misaligned marketing content or product fit causes poor ad performance and high return rates; (4) Logistics and geographic distance, characterized by long delivery times and shipping uncertainties that undermine customer satisfaction; and (5) Economic distance and value misalignment, where differences in price sensitivity and purchasing power create pricing difficulties and margin pressure. (Ghemawat 2011, 1–11; Li et al. 2023, 1–5; Zaheer 2015, 1–10)

Table 2 Categorization of LOF factors by CAGE distances (created with the assistance of Google Gemini)

CAGE DISTANCE FRAMEWORK ALIGNMENT: Cultural (C), Administrative (A), Geographic (G), Economic (E)	
CATEGORY & CAGE TYPE	**IMPACTS & EFFECTS**
Unfamiliarity & Trust Deficit (Cultural/Economic)	• Foreign brand unfamiliar • Lower conversion • Higher CAC
Administrative & Payment Frictions (Administrative)	• Fraud checks & false declines • Lower approval rates • Chargeback risk
Cultural & Language Distance (Cultural)	• Poor ad relevance • Bad fit/quality → high returns
Logistics & Geographic Distance (Geographic)	• Delivery uncertainty • Missed promises → low NPS
Economic Distance & Value Alignment (Economic)	• Price sensitivity • Margin volatility (CM1)

As indicated in Table 2, these frictions/challenges have an impact on crucial metrics like CAC, CVR, or CM1. For instance, lack of customer trust immediately forces higher marketing spend per conversion, whereas others exert indirect effects (Ahmed et al. 2025, 311–314). For example, slightly longer delivery times might mainly impact customer satisfaction or net promoter score (NPS) (meaning a measure of customer loyalty collected/calculated data points) rather than immediate sales. Recognizing these liabilities in their various forms is essential before evaluating how emerging technological tools can help mitigate them (Seufert, 2014). The thesis moves through challenges caused by LOF, to AI capabilities and how those can be leveraged to systematically reduce each of these LOF-induced frictions for D2C e-commerce entrants.

2.3 Frictions and challenges caused by liability of foreignness

2.3.1 Unfamiliarity, administrative barriers and cultural challenges

One of the major LOF frictions is identified as unfamiliarity and trust deficit. A foremost hurdle for a foreign D2C merchant is that local consumers are unfamiliar with its brand and often sceptical of its credibility. This unfamiliarity depresses conversion rates and increases the cost of acquiring each customer (Reinartz et al. 2019, 350–356). Unfamiliarity is one of the primary challenges, meaning the lack of local market insight and the absence of trust, from host-country consumers (Zaheer, 1995). Overcoming this scepticism and trust deficit requires more than just aggressive marketing, it requires trust between the foreign firm and the local consumer (Kopalle et al. 2022, 522–525).

Unfamiliarity is not the only challenge. Another major LOF challenge comes from institutional and regulatory distance: Administrative and Payment frictions. Differences in financial systems, regulatory requirements, and the lack of established local legitimacy in the eyes of intermediaries create this challenge (Li 2025, 1–4). For a D2C e-commerce business, this often materializes as payment processing issues (foreign transactions being flagged or declined), higher fraud risk, and difficulties in unfamiliar legal/compliance procedures for cross-border sales (Chen et al 2022, 1–3). AI technologies are increasingly crucial in overcoming these administrative barriers. A prime example is AI-powered fraud detection and risk management in online payments. The reason is that traditional rule-based fraud filters (often tuned to domestic transaction patterns) tend to produce many false positives when faced with cross-border purchases, because they cannot easily distinguish a legitimate foreign customer from a fraudulent one. This leads to foreign D2C businesses suffering from unwarranted payment declines, chargebacks, and lost revenue, meaning a direct LOF cost. However, as detailed in section 2.4, advanced AI capabilities can now address these specific frictions. (Ahmed et al. 2025, 311–315; Mutemi & Bacao 2024, 419–423; Visa 2025)

Challenges in unfamiliarity, trust deficit and administrative distance go hand to hand with cultural distance, which is also listed as major LOF challenge. Cultural nuances can cause a foreign e-commerce venture's marketing and service efforts to miss the mark. Advertising copy or product descriptions that are not well localized may come across as irrelevant or confusing, lowering ad click-through rates and diminishing user engagement (Salesforce, 2024). Likewise, differences in style, sizing, or usage preferences can lead to customer dissatisfaction (e.g. clothing not fitting as expected in a different market), which in turn increases product returns (Batool & Mou 2024, 1–8).

2.3.2 Logistics and geographic distance

Logistics and geographic distance are one of the main LOF challenges, like the other three ones listed above. In the field of logistics and geographic landscape, cross-border logistics are big pain points in D2C e-commerce business (Chen et al 2022, 1–3). Geographic and logistics context, involving factors between a D2C firm and its overseas customers (Ghemawat 2001, 8–9; Lin 2025, 408–410). This distance has two notable effects on performance. First is experiential uncertainty: consumers cannot physically inspect or try products before purchase, which is especially problematic for categories like apparel, footwear, or cosmetics where fit and style are crucial. Second is cultural differences in sizing, style preferences, marketing, preferences or simply the inability to touch an item amplify this uncertainty for foreign shoppers, often resulting in higher return rates. If consumer is unsure that a foreign product will meet their expectations, they are more likely to either not convert at all or to purchase but then return the item. Both scenarios are bad for D2C firm's metrics (Batool & Mou 2023, 1–6; Tseng & Zhao 2024, 6–12).

In logistics perspective, shipping internationally involves longer transit times, greater uncertainty (due to customs clearance, varied courier networks, etc.), and higher costs, all of which can deter customers and strain the seller's operations (Lin 2025, 408–410). While a D2C model avoids the expense of setting up local warehouses initially, it means each order must travel from the factory to customer locations. However, section 2.4 will demonstrate how AI-driven predictive analytics and route optimization can mitigate these distances and challenges. (Clouthier, 2025; CPSCP, 2025; Liang 2025, 1–2)

2.3.3 Economic distance and value alignment

As described in table 2 economic distance and value alignment, is the last of these major LOF frictions in this context. Economic distance refers to differences in consumer purchasing power, price levels, and economic conditions between the home country and the target market (Ghemawat

2001, 8–9). Even when selling online as an D2C e-commerce firm, the profitability hinges on getting pricing right in each market (Lee et al. 2023, 4–5). If those are too high conversion suffers, however if prices are too low margins are left on the table. Foreign firms often struggle with local pricing strategy due to limited market insight and currency or inflation fluctuations (Eden & Miller 2004, 196–198). This can lead to either lower CVR (if prices are not competitive or not tailored to local willingness-to-pay) or compressed CM1 (if the firm simply duplicates home-market prices without accounting for higher foreign costs or missed premium opportunities). (Lee et al. 2023, 4; Ghemawat 2001, 6–9)

D2C e-commerce firms must bridge economic disparities, like income levels, price sensitivities and willingness-to-pay across consumers in different markets (Ghemawat 2001, 7–9). A product that is affordably priced in the home country might seem expensive in a target foreign market. The perceived value of the product can also vary due to local preferences (Kim et al. 2017, 211–113). Such economic distance can lead to either overpricing (hurting conversion and sales volume) or under-pricing (hurting margins) if not properly addressed (Ghemawat 2001, 5–9). AI capabilities can assist in aligning the value proposition with local market conditions (Davenport et al. 2020, 26–28; Li et al. 2023, 1–5).

2.3.4 Liability of foreignness and systematic AI mitigation

Each of the major LOF frictions in early-stage D2C e-commerce has a clear countermeasure in modern AI capabilities, detailed and described in section 2.4. Foreignness liabilities categorised in Table 2 can be systematically mitigated by deploying the right AI tools (Lin 2025, 408–413; Davenport et al. 25–26). In essence, AI serves as a strategic lever that helps overcome LOF without having to resort immediately to expensive commitments like establishing local subsidiaries or warehouses (Lee et al. 2023, 2–3). By deploying AI, early-stage D2C e-commerce businesses can achieve quicker a level of local effectiveness and efficiency that narrows the performance gap with indigenous competitors (Eden & Miller 2004, 196–200).

Table 3 AI mitigation strategy and tools for CAGE-based foreignness liabilities (Created with the assistance of Google Gemini)

SYSTEMATIC AI MITIGATION OF FOREIGNNESS LIABILITIES

CHALLENGE (FROM TABLE 2)	AI MITIGATION TOOL	SPECIFIC AI FUNCTION	BUSINESS OUTCOME (MITIGATED IMPACT)
Unfamiliarity & Trust Deficit (Lower conversion, Higher CAC)	AI-Powered **Localization & Social Proof Engines**	Generates culturally relevant content, dynamic translation, personalized reviews/testimonials, AI-driven brand storytelling.	**Increased Trust, Higher Conversion Rates, Lower CAC.**
Administrative & Payment Frictions (Fraud checks, False declines, Lower approval, Chargeback risk)	Advanced AI **Fraud Detection & Payment Optimization**	Real-time machine learning for fraud scoring, adaptive authentication, intelligent payment routing.	**Higher Approval Rates, Reduced False Declines, Minimized Chargebacks.**
Cultural & Language Distance (Poor ad relevance, Bad fit/quality → high returns)	Generative AI for **Creative & Cultural Nuance Analysis**	Automated creation of highly relevant, culturally appropriate ads and product descriptions; sentiment analysis.	**Improved Ad Relevance, Better Product Fit, Lower Return Rates.**
Logistics & Geographic Distance (Delivery uncertainty, Missed promises → low NPS)	AI-Driven **Supply Chain & Logistics Optimization**	Predictive analytics for delivery times, route optimization, automated tracking and proactive communication.	Increased **Delivery Certainty,** Met Promises, **Higher NPS.**
Economic Distance & Value Alignment (Price sensitivity, Margin volatility (CM1))	Dynamic Pricing & Margin Optimization AI	Real-time market analysis, competitor price tracking, personalized discount strategies to maximize CM1.	**Optimized Pricing, Reduced Sensitivity, Stable & Improved CM1.**

As now have been acknowledged, LOF represents the additional disadvantages and costs that foreign firms face when entering and operating in new markets, arising from unfamiliarity, discrimination, and distance (Zaheer, 1995). These classical mechanisms are particularly pronounced in factory-direct, no-inventory D2C e-commerce models, where firms bypass intermediaries and interact directly with international consumers (Eden & Miller 2004, 197–198). In this kind of e-commerce context, LOF translates into measurable underperformance across key early-stage D2C e-commerce metrics: higher customer acquisition cost (CAC), lower conversion rate (CVR), weaker contribution margin (CM1), elevated return and fraud rates, and poor delivery promise accuracy. In other words, limited local legitimacy and operational reliability due to foreignness show up as costlier marketing, weaker sales conversion, and thinner early profit margins. (Kim et al. 2017, 186–190; Global eCommerce Payments & Fraud Report, 2024; Visa, 2025)

Ghemawat's CAGE framework offers a useful tool to link these performance challenges to underlying distances between markets. Cultural, administrative, geographic, and economic differences each create informational asymmetries, uncertainty, and misaligned expectations that raise transaction costs as shown. For example, cultural distance, differences in language, norms, and consumer behaviour, breeds unfamiliarity and trust gaps (Ghemawat 2001, 1–10). Foreign D2C brands may struggle with local customers, resulting in lower CVR and the need for more ads spend

or resources (higher CAC) to acquire customers. Administrative distance introduces compliance hurdles and fraud risks, often shown as higher payment failure or chargeback rates that erode revenue (Nachum 2015, 1–3). Geographic distance brings logistical complexity, like longer shipping times, cross-border customs issues, and lack of physical presence (Chen et al 2022, 1–3). These can lead to more experiential uncertainty (customers cannot touch or try products), driving up product return rates, and cause delivery delays that undermine customer satisfaction. Lastly, economic distance brings differences in consumer purchasing power, price levels, currency and make pricing strategies misaligned. For example, a one-size pricing approach may be too high for some markets (hurting CVR) or too low for others (hurting CM1). (Kim et al. 2017, 185–188; Li et al. 2023, 1–5; Reinartz et al. 2019, 350–356)

Each LOF dimension shows specific performance pain point and affects D2C e-commerce business performance differently (Eden & Miller, 196–200; Zaheer, 1995). As illustrated in Table 2, unfamiliarity & trust deficit, together with administrative & payment frictions are the most critical dimensions. Those directly drive the core outcomes of e-commerce business. Meaning higher CAC, lower CVR and weaker CM1 (Lee et al 2023, 3–4; Visa 2025). Modern AI-driven tools can help mitigate these LOF-induced performance challenges. Many of capabilities are integrated into e-commerce, marketing, payment, and logistics platforms, making them accessible even to early stage D2C business. In the following section 2.4, there is highlighted how specific AI solutions target each LOF dimension. For example, personalization and customer-facing AI for cultural distance, fraud analytics for administrative distance, virtual try-ons and logistics AI for geographic distance, and dynamic pricing for economic distance. Improving the corresponding D2C metrics. This suggests that with the right technological levers, born-global D2C firms can convert the LOF into manageable challenges or even advantages. (Davenport et al. 2020, 24–27; Huang & Rust 2018, 155–159)

Artificial intelligence (AI) provides a toolkit of data-driven capabilities that can be directly used to target and mitigate the key mechanisms behind the liability of foreignness in digital D2C commerce. By improving market learning, local responsiveness, and transparency in online operations, AI allows even the small new entrant firms to approximate the advantages of local incumbents (Huang & Rust 2018, 155–159). In marketing segment, AI enables granular segmentation, targeting and positioning, "*meaning a marketing model that redefines whom you market your products to, and how*" (Salesforce, 2024). These AI capabilities are enhanced by real-time experimentation, and hyper-personalization, which raise the efficiency of customer acquisition and lifts conversion (Huang & Rust 2021, 32–38). E-commerce businesses must find the links

between each major LOF friction identified above in Table 2, with corresponding AI-enabled mechanisms that help them overcome that specific challenge. (Ahmed et al. 2025, 311–314; Kopalle et al. 2022, 522–525)

2.4 AI capabilities mitigate challenges caused by liability of foreignness

2.4.1 Mitigating unfamiliarity through AI personalization

One primary dimension of LOF is unfamiliarity, the lack of local market insight and the absence of trust, from host-country consumers (Zaheer, 1995). To bridge the cultural distance and trust gaps that suppress conversion, AI-powered personalization and communication tools have proven effective in closing this gap. Empirical evidence shows that AI-driven personalization can lift e-commerce conversion rates by around 10–15% on average, which in turn improves marketing efficiency and lowers CAC per acquired customer (Amra & Elma, 2025). McKinsey & Co. similarly report that mastering real-time personalization yields 10–15% revenue uplifts for retailers within a year. It is a direct statement to how increased relevance translates to more sales. (McKinsey & Co, 2021). AI can mitigate this trust deficit primarily through advanced marketing personalization and customer engagement tools. Machine-learning algorithms enable granular segmentation and targeting of foreign audiences, ensuring that marketing messages resonate better with local tastes and expectations (Huang & Rust 2021, 32–38). AI-driven recommendation systems and personalization engines can dynamically tailor the online storefront experience for each visitor, showcasing products and content that align with that visitor's browsing behaviour, language, and cultural preferences. This individualization increases the perceived relevance of the foreign seller's offerings, helping to overcome the initial barrier of being an unknown outsider. (Huang & Rust 2018, 155–159; Kopalle et al. 2022, 522–524)

Empirical evidence underscores the impact of this. For example, Yin et al. (2025) highlight that machine-learning-based personalization can clearly raise on-site conversion rates compared to static, one-size-fits-all product displays. Similarly, multi-market studies report higher click-through and purchase propensities when recommendation algorithms tailor content to local user data (Yin et al. 2025, 2–17). These gains are especially critical for new market entrants with low brand familiarity, as they effectively offset LOF's unfamiliarity hazard by building user confidence through relevance (Teepapal 2025, 1–4). In addition, AI-powered conversational agents, chatbots and virtual assistants help establish trust by engaging customers in real time. Modern chatbots, enhanced with multilingual natural language processing, can handle customer inquiries in the customer's native language and with culturally appropriate dialogue. By providing instant, 24/7

support and guidance, AI agents reduce the psychological distance between the foreign seller and local buyer. They convey responsiveness and reliability, thereby nurturing trust even in the absence of a physical local presence (Nayak & Nair 2025, 1–5). AI helps foreign D2C firms appear more familiar and credible to new customers, improving conversion rates and lowering the effective CAC in markets that would otherwise be hard to crack. (Shankar et al. 2021, 13–16)

Furthermore, AI chat integrations to e-commerce lead to significant engagement and sales gains. For instance, one retail group reported a 35% increase in conversion rate along with nearly 40% higher revenue per visitor after deploying an AI chatbot for personalized shopping guidance. In essence, AI bots and agents directly mitigate cultural unfamiliarity by making a foreign e-commerce store feel more native to the customer. This boosts on-site conversion and even retention (as satisfied customers are more likely to return), boosting two key LOF metrics (CVR and CAC) in a positive way. (Amra & Elma, 2025; CPSCP, 2025)

2.4.2 Reducing administrative frictions with AI fraud detection

A second major LOF dimension comes from administrative frictions. In cross-border e-commerce, these often surfaces as payment and fraud risk challenges (Reddy et al. 2024, 1–2). Tools working for domestic transactions (credit cards, address verification, etc.) can misfire for foreign orders. Rule-based fraud prevention systems frequently flag legitimate international purchases as suspicious simply due to unfamiliar patterns (unusual foreign IP address, different currency, etc.), leading to false declines that frustrate real customers and lost revenue. At the same time, real orders from abroad might slip through or result in chargebacks, especially when an early-stage D2C firm lacks local fraud expertise. These issues inflate fraud loss rates and operational costs denting contribution margins. (Global eCommerce Payments & Fraud Report, 2024; Visa, 2025)

AI-driven fraud detection systems have emerged as a powerful tool to address these administrative-distance pains. Unlike static rules, modern fraud models use AI machine learning to analyse a multitude of data points in real time, enabling far more accurate distinction between genuine and fraudulent orders. Industry reports confirm that ML-based fraud screening markedly outperforms legacy systems. Firms, especially in e-commerce sector adopting AI fraud systems have seen false decline rates drop by 20–30% on average while improving overall fraud catch rates. By approving more orders without raising fraud losses, these systems effectively recover revenue that would have been wrongly cancelled. In fact, some merchants leveraging connected AI platforms (combining network data and behavioural analytics) report up to 65% fewer false positives and over 70% fewer

chargebacks after implementation. (Global eCommerce Payments & Fraud Report, 2024; Mutemi & Bacao 2024, 419–429; Reddy et al. 2024, 1–2; Visa, 2025)

AI fraud tools not only protect revenue but also increase trust and loyalty. Customer who is not falsely declined is more likely to come back. AI-driven fraud prevention directly mitigates the administrative/institutional component of LOF. It smooths out cross-border financial transactions by reducing payment friction, which boosts conversion rates and protects CM1 by cutting fraud-related costs. Equally important factor is that it builds institutional trust: payment processors and customers grow confident that the D2C e-commerce firm can handle international transactions securely, further easing foreign-market liabilities. (Global eCommerce Payments & Fraud Report, 2024; Mutemi & Bacao 2024, 419–421; Visa, 2025)

2.4.3 Mitigating cultural frictions

A second major LOF dimension is cultural frictions. AI capabilities offer powerful tools for mitigating challenges caused by LOF. AI capabilities offer easy way to bridge cultural and linguistic gaps of e-commerce business. Automated translation systems, powered by advanced language processing models, provide high-quality localization of website content, product reviews, and customer communication in real time. This means a small D2C firm can instantly offer its online store and support in multiple languages without hiring separate local teams. (Tige 2019, 5–9)

AI-based translation and localization can significantly improve foreign customer satisfaction and willingness to buy. It can adapt the messaging tone and creative content to fit each local cultural norm. These AI-based tools determine which offer to present, while affective computing adjusts how the message is delivered to suit local cultural sensibilities. For example, an AI system might learn that humour or symbolism that works in one country’s ads does not resonate in another and accordingly modify the campaign imagery or wording. By continuously experimenting, testing and learning from user interactions, AI systems refine their cultural understanding, reducing the waste in resource spend that comes from cultural mismatches. (Hassan et al. 2025, 2–6; Huang & Rust 2018, 164; Nayak & Nair 2025, 1–10)

In apparel e-commerce virtual try-on tools powered by AI and machine learning allow customers to see how a specific fit might look on them, even when the item is sold from abroad. These AI-driven fit recommendation systems have been shown to reduce size-related returns and boost customer confidence in purchasing unseen products, from foreign seller (Batool et al. 2024, 1–6). A recent systematic review by Batool et al. (2024) shows that virtual fitting technologies significantly

decrease return rates by addressing the tactile gap inherent in online shopping. Retail studies in 2025 report measurable declines in return merchandise rates after deploying AI virtual try-on solutions (Angelbratt 2025, 6–13). AI enables deep localization, linguistically, culturally, and experientially, which helps foreign D2C firms avoid the pitfalls of cultural distance, increase customer engagement, and reduce friction such as product returns that erode early profitability (Batool et al. 2024, 1–6).

2.4.4 Overcoming geographic distance via predictive logistics

AI technologies are playing a pivotal role mitigating these geographic frictions by optimizing logistics and improving supply chain visibility. Predictive analytics and machine learning allow firms to forecast delivery times with much greater accuracy by analysing historical shipping data, real-time transit information, and external factors like weather or customs (CPSCP, 2025). For example, DHL, UPS and other global logistics providers use AI models to anticipate delays and adjust routes dynamically, yielding more reliable estimated delivery dates (Clouthier, 2025). By communicating more precise delivery expectations (and meeting them), foreign e-commerce sellers can reduce customers' uncertainty about ordering from abroad. (Liang 2025, 1–2)

AI-driven route optimization is another key capability. Algorithms can identify the fastest or most cost-effective shipping routes and modes, directly mitigating the time and cost disadvantages of geographic distance (CPSCP, 2025). Transparency helps maintain trust: customers can track their orders in real time and receive proactive notifications if delays occur. Supply chain management indicates that real-time AI decision support can sharply reduce downtime and errors in global logistics, effectively lowering the risk of late deliveries or lost parcels for overseas buyers (Liang 2025, 1–10). AI allows D2C operation coordinate a far-reaching logistics network with efficiency and reliability. By improving delivery speed and consistency, technologies alleviate the geographic distance penalty, and customers feel more confident ordering from a foreign D2C seller, because it does not mean long waiting or uncertainty. Efficiency and performance in logistics also have a cost-side benefit for the firm: fewer failed deliveries and returns, and more repeat orders, all contributing positively to early performance metrics. (Lin 2025, 408–414)

AI capabilities are helping this, for example with virtual try-on (VTO) and AI sizing recommendation systems. Allowing customers to visualize products on themselves or get algorithmic size suggestions tailored to their body measurements and past fits (Batool & Mou 2023, 1–6). These tools directly beat the concerns of returns. These virtual try-on features have been shown to significantly reduce product return rates (Angelbratt, 2025, 6–7). Comprehensive VTO

solutions can cut online apparel return rates by roughly 20–30% on average. In some cases, retailers have achieved up to 40% reduction in returns for specific high-fit-sensitive product lines through augmented reality try-on technology. Improvements directly boost CM1, because fewer returns mean less revenue reverse and lower handling costs. (Batool & Mou 2023, 1–6)

Logistics is crucial context because when doing business international markets, it inherently involves longer transit times and more points of potential failure. However, AI capabilities can be easily used to solve logistics problems (Kim et al. 2017, 185–186). AI-powered logistics optimization includes predictive transit time algorithms and dynamic route planning. Helping D2C companies provide faster, more reliable shipping even across borders (Liang 2025, 1–2). For example, estimated time of arrival (ETA) prediction models use AI machine learning on historical shipping data and real-time conditions to accurately inform customers of when to expect their package, adjusting for delays proactively.

Likewise, route optimization AI can reorganize last-mile delivery routes on the fly to avoid traffic or group shipments efficiently (CPSCP, 2025). The impact on performance is significant, because firms that deploy real-time visibility and route optimization solutions can achieve around 25% faster delivery times on average, while reducing logistics costs by 40–50% (Patel, 2025). Importantly, on-time delivery rates improve substantially this way. Customers also notice these improvements, and the customer loyalty gets a boost (Clouthier, 2025). Comprehensive last-mile AI visibility tools boost customer satisfaction scores by 53% relative to baseline, in best cases (Patel, 2025). In practical terms AI-driven logistics systems mitigate geographic distance by improving transparency and reliability. When a D2C e-commerce firm can consistently meet its delivery promises abroad, it builds trust with customers despite being foreign. That translates into higher NPS, more repeat orders, and a healthier long-term CVR and CAC (since returning customers are cheaper to re-acquire). (Lin 2025, 408–410, 413–415; Hassan et al. 2025, 2–5; Seufert, 2014)

2.4.5 Bridging economic distance through dynamic pricing

The final major LOF dimension is economic distance. Key to mitigate economic LOF challenges is AI-powered dynamic pricing possibilities. AI-driven dynamic pricing uses machine learning, and firms can analyse a multitude of factors, like local demand trends, competitor prices, currency exchange fluctuations, and even individual customer behaviour, as the goal is being able to set optimal prices for each market segment in real time (Sahoo 2025, 4194–4197). D2C business could automatically adjust its prices in each country to reflect what local customers are willing and able to pay maintaining also competitiveness. Dynamic pricing algorithms have been successfully

employed in online retail to boost revenue and market share, and they are particularly useful in international contexts where price elasticities differ across borders (Anglen, 2025).

Beyond pricing, AI can tailor which product features etc. to emphasize for a particular market (Huang & Rust 2018, 155–158). For instance, if data show that customers in Market A care more about durability while those in Market B care more about design, an AI system can highlight reviews and content to those priorities for each market. AI allows retailers to reconfigure elements of the customer experience. From product recommendations to service policies, AI helps retailers to respond to local consumer expectations, boosting customer satisfaction and loyalty even for foreign brands (Hassan et al. 2025, 2–6). AI-driven demand forecasting can also inform production and inventory decisions so that a D2C firm can avoid stockouts or oversupply in each market, indirectly contributing to stable pricing and customer trust. By leveraging AI, D2C entrant can erase the economic distance, by learning to compete on value just as a local company would, using data to know its foreign customers' preferences and price thresholds. Outcome is better margin management and improved conversion aligning with the firm's strategic aim of sustainable international growth. (Lin 2025, 409–415; Davenport et al. 25–28)

By analysing real-time demand, competition, and customer behaviour data, pricing algorithms can adjust a D2C firm's product prices dynamically for each market or even each user segment (Davenport et al 2019, 24–27; Liang 2025, 1–2). Retailers typically keep a portion of highly visible, frequently searched items, known as key value items, which are priced very competitively because consumers strongly remember these prices. Although key value items generate most of a retailer's revenue, they contribute relatively little to profit, meaning margins must be recovered on the remaining long-tail items. However, identifying these key value items and pricing low-volume or new products is difficult, due to limited historical sales data. Modern dynamic-pricing systems address these challenges through five analytical modules (BenMark et al. 2017, 1–4):

1. **Long-tail module**: Sets initial prices for new or low-data items by matching them to comparable, data-rich products.

2. **Elasticity module**: Estimates how demand responds to price changes using time-series data, seasonality, competition, and cannibalization effects.

3. **Key value item (KVI) module**: Determines which products most influence consumer price perception, updating automatically based on real market data.

4. **Competitive-response module**: Suggests price updates based on real-time competitor pricing.

5. **Omnichannel module**: Aligns pricing across online and offline channels.

While the full suite delivers the best performance, retailers often begin with key value items and competitive-response modules and expand over time. Building an effective dynamic-pricing system requires first understanding the retailer's strategic goals and market context and then designing pricing algorithms around those priorities. McKinsey & Co have visualised these five modules of dynamic pricing in their analysis. (BenMark et al. 2017, 2–3; Davenport et al 2019, 24–27; Liang 2025, 1–2)

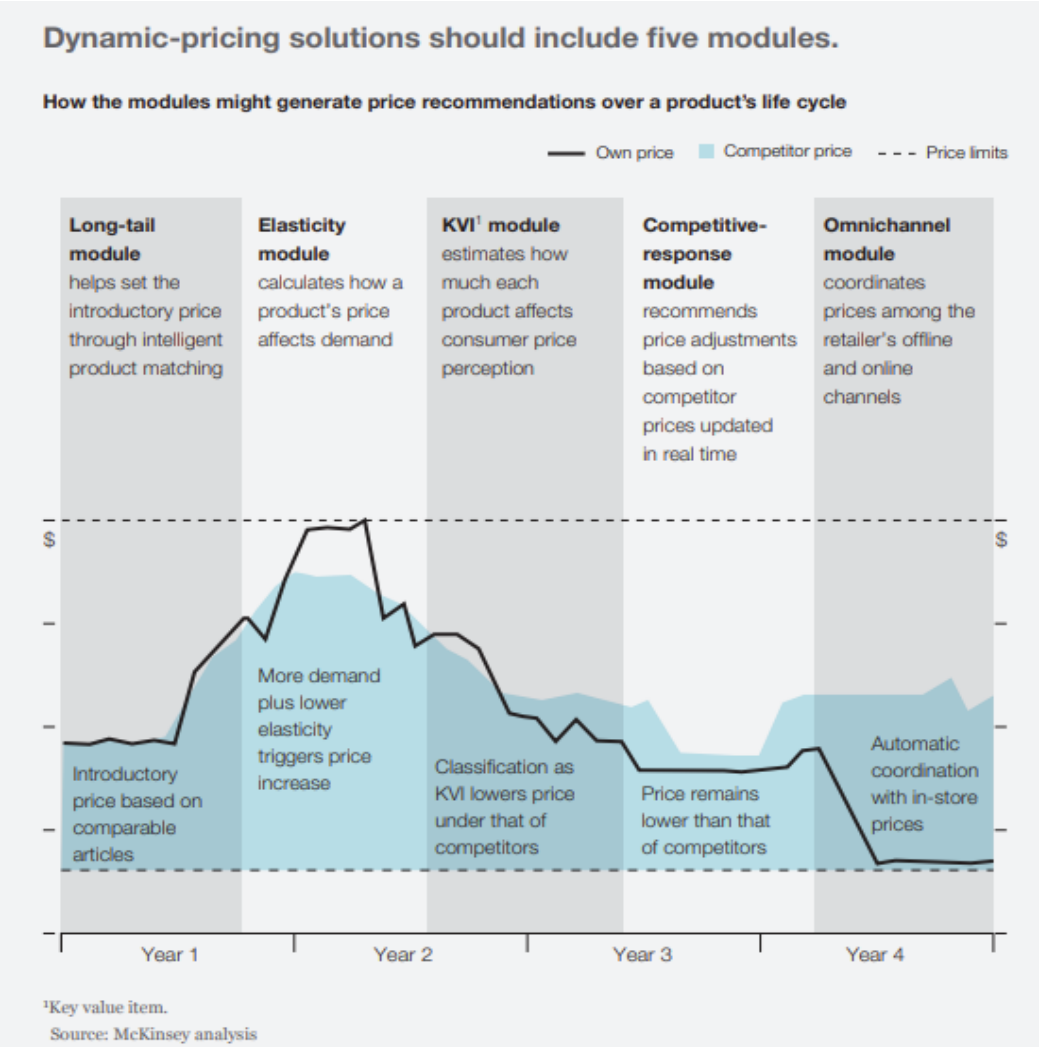

Figure 1 Five modules of dynamic pricing (BenMark et al. 2017,3)

The figure 1 illustrates how the five dynamic pricing modules are applied sequentially over a product's life cycle, represented by the timeline from year 1 to year 4.

- Year 1 (Launch): The Long-tail module is used first to set an introductory price for new items by matching them to similar exiting products.
- Year 2 (Growth): As data accumulates, the elasticity and key value item modules take over. These adjust prices based on how sensitive customers are to price changes (elasticity) and how the product affects overall price perception (Key value item).
- Year 3–4 (Maturity & Maintenance): In later stages, the competitive-response and omnichannel modules ensure the price stays competitive against rivals and is consistent across both online and offline stores. (Benmark et al. 2017, 1–6)

According to McKinsey & Co, companies that implement dynamic pricing engines, see 2–5% increases in sales and 5–10% improvement in profit margins as a result. These gains come from selling more units via optimized prices and capturing more value per sale (McKinsey & Company, 2017). Even small algorithmic adjustments can have impact. For a retailer operating at ~10% profit margin, a mere 1% price increase (well-targeted so as not to deter buyers) can yield about a 10% boost in profit. Leaders in e-commerce business sector have demonstrated what is also possible. Amazon for example, have famously attributed roughly 25% profit growth to its dynamic pricing capabilities, which constantly reprice millions of items to match demand patterns (Onramps, 2025). For a new D2C entrant in e-commerce scene, AI-driven pricing tools offer a way to compete with local incumbents on value, mitigating the economic LOF. The foreign firm can algorithmically learn each market's ideal price points, manage exchange rate risks, and even personalize prices or promotions to different customer segments. The result is often higher conversion rates (customers see prices aligned with their expectations or local deals) and improved CM1 (through better margin control). (McKinsey & Company, 2021; Teepapal 2024, 1–4)

2.4.6 Overall impact of artificial intelligence

AI's overall impact on early-stage D2C e-commerce business performance is huge. Across all these distances and dimensions, a clear pattern emerges. Each LOF-related friction and problem can be countered by a specific AI capability, yielding a measurable boost to one or more D2C businesses performance metrics. Cultural distance issues of unfamiliarity are addressed by personalization and chatbots, which have been shown to raise conversion rates on the order of 10–30% and correspondingly lower CAC by making marketing spend more effective (Amra & Elma, 2025; Marketing Insider, 2025). Administrative distance problems in payments are managed by fraud analytics, which reduce false declines and chargeback losses by double-digit percentages. Directly

protecting revenue and easing the cost of doing business abroad. Geographic distance challenges in product fit and delivery are softened by virtual try-ons (cutting return rates ~20%) and AI logistics, improving on-time delivery and customer satisfaction by >50% (Patel, 2025; Fytted, 2025). Economic distance, finally, is bridged by dynamic pricing algorithms that can add a few percentage points to sales and significantly bolster margins sale (McKinsey & Company, 2017). For instance, a higher conversion rate means a lower effective CAC. Meaning reduced fraud and returns preserve margin which can be re-invested in growth. Better delivery and local pricing are increasing customer lifetime value, further lowering CAC in the long-term (McKinsey & Company, 2021).

D2C e-commerce firm, especially in early stage, can leverage this set of AI tools and capabilities to succeed in foreign markets and in international business. By systematically mitigating LOF, the firm turns distance and unfamiliarity into an opportunity for data-driven adaptation. In essence, AI allows even an early-stage firm with no physical presence to approximate the customer knowledge, trust, and efficiency of a local player (McKee et al. 2025, 1–5). Use of AI capabilities together with marketing, sales, and operations, enables faster international scaling with less friction. D2C firms who embrace these AI levers are better positioned to achieve sustainable performance abroad, converting foreign market entry’s high risks to opportunities of growth. (Patel, 2025)

3 Conclusion

The aim of this thesis was set out to examine how the liability of foreignness (LOF) manifests in early-stage, factory-direct D2C e-commerce and, how modern AI capabilities can mitigate these challenges. The analysis confirms that even in a digital-first e-commerce model, LOF remains a critical barrier. A fully online entrant still faces fundamental trust deficits and legitimacy hurdles in foreign markets. Lacking local embeddedness or a physical presence, new D2C firms abroad are perceived as outsiders, which translates into measurable performance penalties such as higher customer acquisition costs (CAC), lower conversion rates (CVR), and thinner early profit margins. These outcomes echo classical international business theory, where foreign firms incur extra costs and credibility challenges (Zaheer 1995). However, in the D2C context they appear in novel forms, like digital trust gaps and logistical uncertainties. A key finding of this thesis is that LOF is still highly relevant in digital commerce. So, being online does not erase cultural and institutional distance; rather, it amplifies the need to quickly build trust and legitimacy across borders, lest each customer interaction become costlier and riskier than for domestic competitors.

Against this backdrop, the thesis highlights that AI-based capabilities offer effective levers to offset the LOF. Even resource-constrained startups can now utilize AI tools embedded in e-commerce, marketing, payment, and logistics platforms to perform tasks that once required substantial local presence. The research identified a clear mapping between LOF challenges and AI solutions. For instance, AI-driven personalization and customer-facing chatbots help overcome cultural unfamiliarity by localizing content and engagement, thereby narrowing the psychological distance between foreign seller and local buyer. AI fraud analytics and payment security address institutional and administrative distance, screening out risks while smoothing transactions to build customer trust in cross-border payments. Likewise, AI-powered logistics tools (e.g. predictive transit algorithms and virtual try-on technologies) mitigate geographic distance by improving delivery reliability and reducing product return uncertainty. And last the dynamic pricing algorithms to tackle economic distance allow foreign D2C firms to tailor prices to local market conditions in real time. It is now clear that each of these AI capabilities directly targets a facet of LOF, helping the firm appear more local, reliable, and attuned to the target market’s expectations.

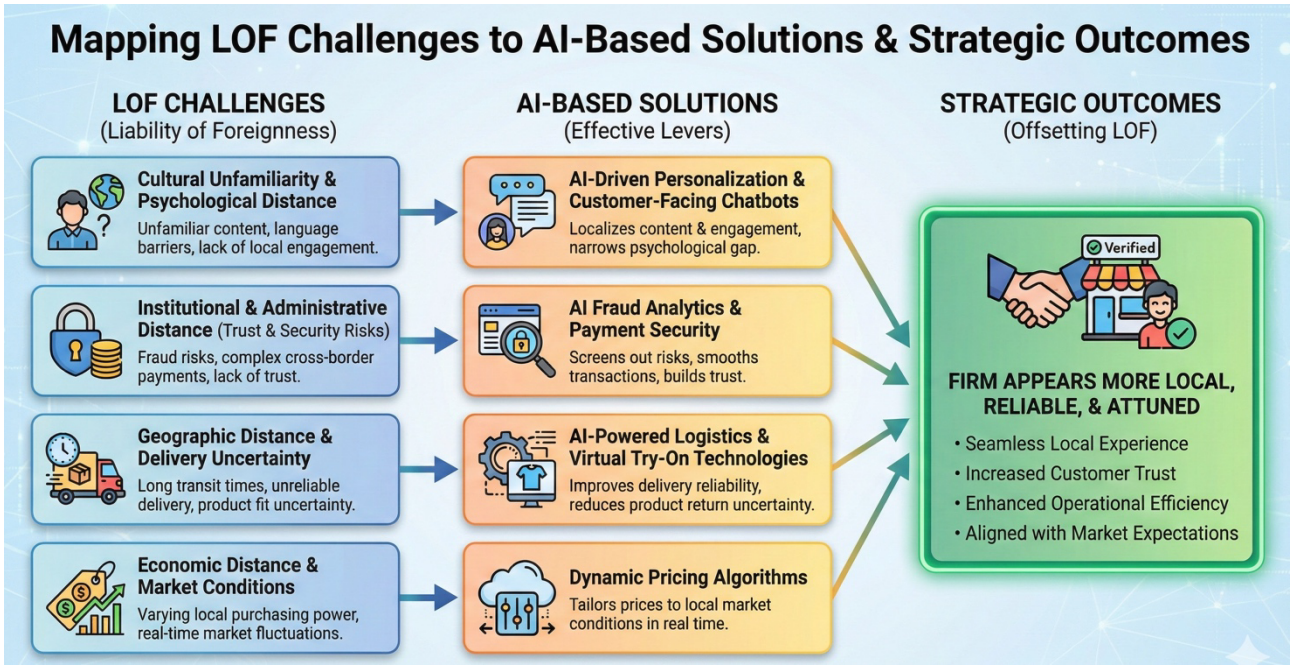

Figure 2 Mapping between LOF challenges and AI solutions (Created with the assistance of Google Gemini)

Empirical studies cited in this thesis further underscore the impact. For example, AI personalization can lift conversion rates by 10–15% on average, improving marketing efficiency and lowering CAC. While advanced fraud detection systems have cut false transaction declines by 20–30% and dramatically reduced chargebacks for firms deploying them. These improvements translate into stronger early-stage performance abroad, higher sales conversion, lower fraud losses and returns, and better customer retention. Essentially mitigating LOF's negative effects on key metrics. All these findings demonstrate that although the liability of foreignness continues to pose serious obstacles for digital D2C ventures, AI-driven tools can significantly help with problematic factors and give many opportunities. By using AI to reduce uncertainty and enhance legitimacy in the eyes of overseas stakeholders, even small born-global e-commerce firms can convert foreignness from a crippling liability into a manageable challenge, or even a source of competitive advantage.

Practically, this thesis carries important insights for entrepreneurs and manufacturers pursuing direct-to-consumer e-commerce across borders. A central implication is that embracing AI capabilities early can help new D2C ventures overcome foreign market frictions without the need for an immediate local presence. Rather than viewing LOF as an insurmountable penalty, founders should treat it as a set of problems that can be tackled with smart digital strategies. Based on the thesis findings, several actionable recommendations emerge for early-stage D2C entrepreneurs.

One of the most effective ways for a e-commerce firm to bridge the gap with international customers is to aggressively leverage AI-driven personalization and localization. By utilizing recommendation engines, AI translation, and chatbots, an online storefront can be tailored to match the specific language, cultural nuances, and preferences of a new market. This transforms a potentially alienating foreign website into a platform that feels locally relevant and responsive, engaging customers who might otherwise distrust an unfamiliar brand. This effort to build credibility must extend to the checkout process, where implementing AI-powered fraud detection is critical. Early-stage D2C firms should integrate payment gateways that use machine learning to analyze transactions in real time; this minimizes false declines while efficiently catching fraud. By ensuring a seamless, secure payment experience, a young brand can signal reliability and safety, effectively distinguishing itself as trustworthy despite its outsider status.

Beyond the customer interface, new D2C ventures must utilize predictive logistics and data-driven insights to ensure operational excellence. Since delivery reliability is a major concern for cross-border shoppers, capitalizing on AI for supply chain management, such as predictive demand planning and route optimization is essential. These tools allow a startup to provide accurate delivery times and proactive tracking updates, turning logistics into a competitive strength rather than a weakness. Simultaneously, these firms can address the complexities of international economics through AI-driven dynamic pricing. Rather than guessing, entrepreneurs can continuously adjust prices based on real-time local demand, competition, and currency fluctuations. This data-driven approach not only maximizes revenue but also accelerates the learning curve regarding local market behaviors, allowing the firm to position itself competitively from the start.

When taken together, these strategies form a practical guidebook for mitigating the liability of foreignness in the D2C e-commerce sector. AI must complement, not replace, a sound international business strategy. Entrepreneurs must still actively cultivate customer trust and adapt to local norms, using AI simply as a mechanism to achieve these goals at scale. The analysis suggests that firms thoughtfully integrating AI across personalization, fraud prevention, logistics, and pricing are significantly better positioned to establish legitimacy. By combining a deep awareness of foreign market challenges with these advanced technological solutions, early-stage D2C companies can improve their odds of success and establish a foothold abroad.

While this thesis provides a conceptual framework and initial evidence for AI’s role in mitigating the liability of foreignness, it is important to acknowledge the limitations of the current research. As the analysis is primarily theoretical and exploratory, it opens several critical avenues for further

academic inquiry to validate these concepts. The intersection of classic international business challenges with cutting-edge AI technology is a rapidly evolving field, and future research must move beyond conceptual modeling toward empirical validation. A necessary next step is to test the proposed mechanisms in real-world settings through quantitative analyses or longitudinal case studies of D2C e-commerce startups. By measuring how effectively specific AI interventions improve key success metrics, such as trust, conversion, customer acquisition costs, and retention, researchers can determine if firms adopting personalization and fraud analytics truly experience a reduced penalty of foreignness compared to those that do not. Such work would provide the concrete evidence needed to refine the conceptual claims made here.

Furthermore, the effectiveness of AI tools in mitigating LOF is likely context-dependent, suggesting a need for comparative studies across different markets and industries. The utility of specific AI applications may vary significantly between developed and emerging markets, or between distinct product categories such as fashion retail versus consumer electronics. Cultural and institutional contexts could further moderate these effects; for instance, an AI chatbot might be well-received in one culture but viewed with skepticism in another. Future research should therefore explore these nuances to understand how digital foreignness effects emerge in specific contexts. Additionally, as the technological landscape advances with breakthroughs in generative AI, scholars should investigate how next-generation tools can further reduce perceived foreignness by automating culturally tailored marketing or enabling real-time, localized customer service. However, this research must also address the tension between efficiency and the human touch, examining whether heavy reliance on AI enhances trust through consistency or inadvertently raises privacy concerns and feelings of impersonality.

The integration of AI into broader international business strategy also warrants deeper investigation. Historically, firms have relied on joint ventures or local agents to overcome LOF, but AI now offers alternative, virtual means to build legitimacy. Future scholarship should examine the extent to which digital strategies can substitute for, rather than merely complement, these conventional tactics. It remains to be seen whether a born-digital company can completely forgo physical expansion by leveraging AI, and how stakeholders such as investors perceive this approach compared to traditional internationalization. Simultaneously, the ethical and long-term implications of cross-border AI deployment must be considered. Issues regarding algorithmic bias, compliance with varying international data laws, and the potential for AI to create new forms of liability are critical areas for study. As AI capabilities become universally adopted, identifying the next source

of competitive advantage beyond mere technological implementation will be essential for sustaining growth.

In conclusion, this thesis contributes to the international business literature by applying the classic liability of foreignness concept to a digital, early-stage D2C e-commerce context. The analysis illustrates how emerging AI capabilities can serve as a strategic counterweight to these liabilities, offering practical guidance for entrepreneurs aiming to build globally competitive businesses. However, it must be emphasized that technology is not a silver bullet; it functions as an enabler within a broader business strategy rather than a replacement for market understanding. Success as a foreign entrant requires combining high-tech tools with deep human insight to meet customer expectations. By leveraging these dual competencies, modern digital ventures can navigate the challenges of foreignness more effectively than in the past. Hopefully this thesis serves as a foundation for further scholarly inquiry and provides a roadmap for D2C e-commerce startups to approach global expansion with informed preparedness.

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Appendices

Appendix 1 Use of Generative Artificial Intelligence

In this thesis, AI-based tools were used only as supporting tools to enhance the research process. The AI tools did not produce, generate, or formulate the academic text of the thesis. All interpretations, arguments, analysis, and written content are entirely my (the author's) own. Consistent with the University of Turku's AI guidelines, the following tools, versions, and purposes of use are reported transparently.

AI tools were used in this thesis for supportive and meta-level tasks: 1) Understanding theories and topics that I want to research in my thesis, 2) Checking literature relevance, source search and avoiding outdated sources, 3) Ensuring language clarity and spelling corrections, academic wording (nom-colloquial) and consistent terminology, 4) Structuring the thesis outline to move as logically and coherent as possible, so that the main idea will not vanish at anytime, 5) Increasing the efficiency to find relevant sources fast and filter the right ones, and 6) As help to create visual figures/tables.

I used DeepL for spelling corrections and language care/improvements throughout the planning process of writing this essay. DeepL helped me improve and translate from Finnish to English some non-academic complex words in my text, so I could change too colloquial words to more coherent and correct academic wording.

I used Google Gemini 3 Pro as help to create visuals, (Figure 3). I gave Gemini the theory and theoretical information from chapter 3 and asked Gemini to make figure based on my text. Prompt here was: "Create, which has a clear mapping between LOF challenges and AI solutions. AI solutions directly target the liability of foreignness by narrowing cultural, geographic, and economic distances. These capabilities allow foreign firms to act as local and reliable players, effectively meeting target market expectations."

I used ChatGPT 5.1 and Claude AI -Sonnet 4.5 / Haiku 4.5 to help outline and structure my thesis to move in as coherent way as possible. It included structure ideas and ideas about how I should start to build up my thesis outline (introduction… conclusion etc.). ChatGPT and Claude AI helped me to start producing thesis as coherent as possible and so it would have a logical structure and flow.

ChatGPT 5.1 was also used as help for explaining complex academic models to myself, so that I understand them before starting to find relevant sources regarding those theories/models (e.g., CAGE, dynamic/artificial intelligence capabilities etc.).

ChatGPT and Claude AI were also used to find relevant and interesting to my topic relevant sources (from, for example Google scholar and internet). These basically helped identify at some points, what additional literature might be relevant for a given theme. Together with these AI-tools I found more interesting academic sources and articles, which I could use in my thesis. From those I got to reflect on and gain more knowledge about the topic I needed to be studying. AI found me many different relevant sources, so it would be easier for me to study them through and not spend time finding sources via internet search.

Semantic Scholar & Google Scholar AI filters were used to locate best possible source options that would match my thesis and the topic. These helped and eased the source reading process by checking abstracts and keywords through. AI filters with that function helped to see if the source would be a match and relevant for me.

Scite.ai was used in my thesis to check, whether an article to use is strongly supported, disputed, or mentioned in later research.

I highlight the transparency with the fact that all tools and uses of AI, are reported openly. AI was used only within allowed supportive functions, which highlights the responsibility.

AI did not write any of the text in the thesis, and the core text was fully written by me (the author). Whole text together with all the reflections, arguments, insights and examples were my own or my reflections from theoretical/academical sources, with proper references.

AI tools did not generate or write any of my final text and everything is my personal insights and reflections or my reflections/theory from theoretical/academical sources (articles, books, reports, thesis, research). AI only helped me to outline and somewhat structure the essay to be as coherent and smooth as possible.

I highlight and confirm that I have used AI with all caution, and I take full responsibility for the whole content of this paper. The author retains full responsibility and relevance content and its alignment with thesis requirements and guidelines.