A Cloud-Enabled Approach to Premium Retail Operations for Evoque Parfums

Executive Summary

Evoque Parfums is a boutique and online retailer of luxury fragrances, with flagship stores across Europe and a rapidly expanding global e-commerce platform. The business depends on seamless, high-touch customer experiences and faces two immediate technical challenges: pronounced traffic and sales spikes around launches and holidays, and the need to deliver privacy-safe, highly personalised service to its client base.

This report outlines a cloud strategy tailored for business needs, striking a balance between agility and governance. The proposed hybrid cloud architecture safeguards sensitive Personally Identifiable Information (PII) and payment systems in a secure private environment while leveraging the public cloud for elastic web services, analytics, and AI workloads. To enhance manageability, the infrastructure will employ modular Infrastructure as Code, facilitating repeatable and auditable deployments while minimising the risk of vendor lock-in. By utilising CI/CD automation, policy-as-code, and integrated security scans, release cycles can be significantly shortend, while ensuring adherence to compliance standards. Additionally, the implementation of an AI recommendation service aims to boost conversion rates and increase customer lifetime value, particularly when paired with a straightforward fairness and explainability checklist.

Equally prioritised are risk management and regulatory compliance, with recommendations focusing on data protection, payment security, and operational continuity. Finally, this strategic proposal positions Evoque Parfums to capitalize on emerging trends like edge computing and advanced AI, fostering innovation while upholding strong governance practices.

Introduction and Business Needs

"*With Black Friday, Sinterklaas and Christmas on the horizon, retailers must make sure their systems can stand up to the demand of the busiest season for online shopping. Even a small system failure can have big impact on sales in the final weeks of the year."* (Consultancy.eu 2024)

Starting with this citation, the follwing report develops a cloud-enabled approach for **Evoque Parfums.** Evoque Parfums is a boutique and online retailer specialising in

high-end fragrances.
Evoque Parfums currently faces significant scalability and performance challenges during new fragrance launches, when online traffic and transaction volumes outgrow average capacity. Further they are confronted with seasonal demand fluctuations (as shown in Figure 1), the need for personalised customer experiences, and strict EU data and payment regulations.

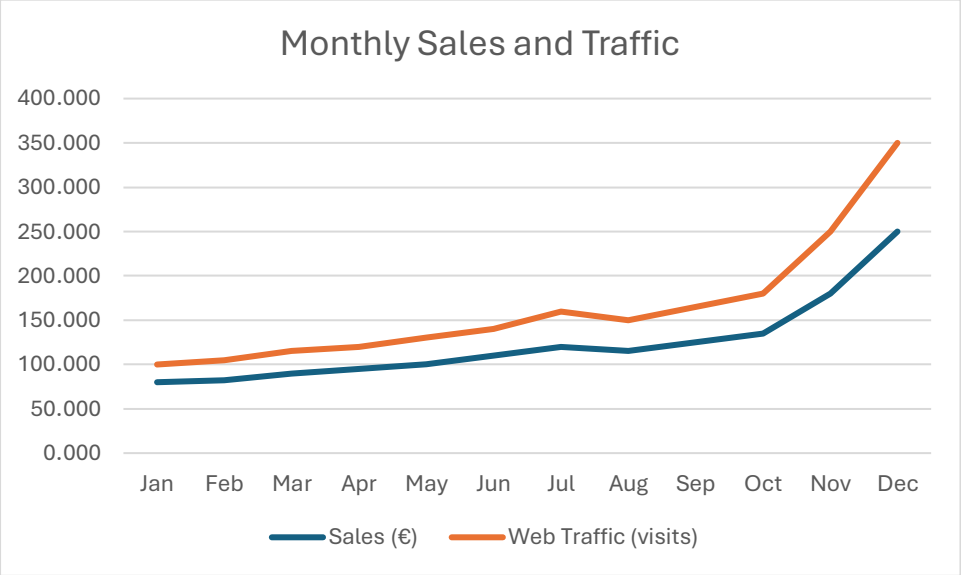

Figure 1: Monthly sales and traffic trends (Hamberger, 2025)

Using cutting-edge cloud technology allows Evoque Parfums to achieve greater flexibility, increased security, and better cost management, which allows Evoque Parfums to maintain its premium status in the luxury retail sector. Other market leaders in the industry have already dopted this technology. For example, Estée Lauder works with Google Cloud to embed generative AI in Estée Lauder brand sites to improve sentiment analysis and Estée Lauder's research and development activities (PR Newswire, 2023). LVMH collaborates with Alibaba Cloud to use AI technology in China to transform retail experiences and integrate luxury experiences during purchases (LVMH, 2025).

Cloud Solution Design

The proposed cloud solution for the Evoque Parfums adopts a **hybrid deployment model**, designed to balance scalability with EU privacy requirements.

Public cloud resources host the web front-end, AI-driven recommendation engines, and analytics workloads, while personally identifiable information (PII) and transactional databases are isolated in a private cloud or virtual private cloud (VPC). This choice was taken based on NIST (2021), which identifies hybrid deployments as effective for organisations requiring both flexibility and strong control over sensitive data. A full public cloud was considered but rejected because GDPR compliance

challenges make it difficult to guarantee data locality and operational transparency (Ghasemshirazi, Shirvani and Alipour, 2023). Conversely, a full private cloud would severely restrict elasticity, especially during seasonal demand spikes such as holiday periods. Figure 2 show the proposed architecture, picturing the separation of PII into private subnets while public-facing services and AI workloads reside in the public cloud.

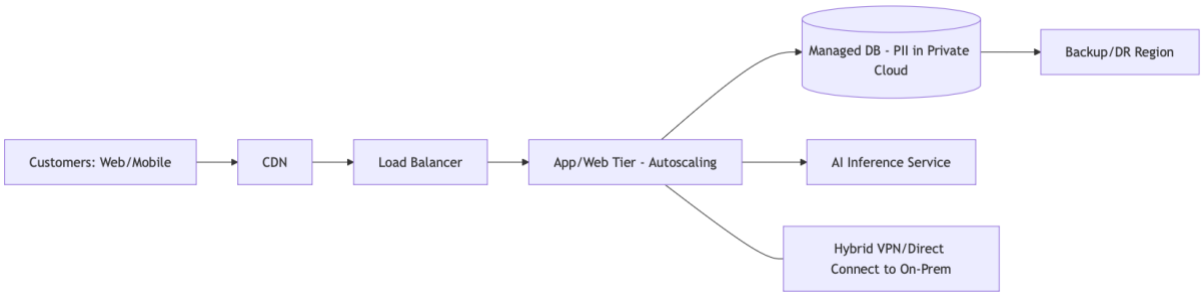

Figure 2: High-level hybrid cloud architecture for Evoque Parfums (Hamberger, 2025)

- Infrastructure as Code (IaC) ensures reproducible, auditable, and automated deployment of the hybrid environment.
- Terraform was selected for its cloud-agnostic capabilities and modular design, which reduces vendor lock-in and supports long-term strategic flexibility (Almorsy et al., 2016; HashiCorp, 2022).
- Modules are structured around network, compute, storage, IAM, and monitoring, each integrated into a continuous integration and delivery (CI/CD) pipeline.
- Remote state management ensures consistency across distributed teams, mitigating risks of concurrent configuration changes.

Figure 3 visualises the module structure and CI/CD workflow, demonstrating how modular IaC supports maintainability, collaboration, and controlled deployments without exposing code-level details. While alternative tools such as CloudFormation or Pulumi were considered, Terraform's wide adoption and clear modular philosophy made it preferable (Almorsy et al., 2016; HashiCorp, 2022).

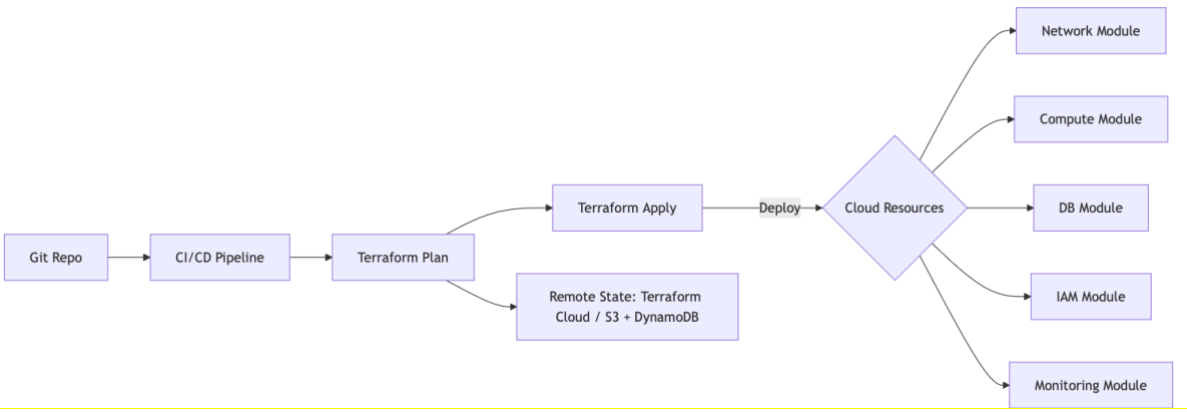

Figure 3: Infrastructure as Code (IaC) workflow (Hamberger, 2025)

Resilience and scalability are embedded throughout the design.

- Application servers are organised into autoscaling groups**,** allowing dynamic adjustment to fluctuating demand, reducing the risk of over-provisioning or service degradation (Amazon Web Services, 2023).
- Managed relational databases are deployed with multi-AZ failover and cross-region read replicas, providing high availability and mitigating the risk of data loss in regional outages.
- Static assets such as product images are distributed through a content delivery network (CDN)**,** enhancing performance for global customers.

While Zhang et al. (2022) critically note that multi-region replication and CDN use increase operational complexity and cost; Almorsey et al. (2016) demonstrates that the financial impact of downtime during peak retail events often exceeds these additional costs, validating the trade-off.

Security follows a defence-in-depth strategy**.** Private subnets, KMS-encrypted storage, and least-privilege IAM policies safeguard sensitive data. A web application firewall (WAF) protects the cloud environment against threat and denial-of-service attacks, while centralised logging provides visibility for monitoring and compliance. Implementing a zero-trust architecture ensures identity-first access and continuous verification, which is crucial for hybrid systems where perimeter-based security is insufficient (Rose et al., 2020; Ghasemshirazi, Shirvani and Alipour, 2023).

Monitoring and observability enhance resilience by aggregating metrics, traces, and logs into managed services such as CloudWatch or Azure Monitor, with automated alerts for anomalies. This proactive monitoring approach reduces reaction time in case of incidents, even in complex hybrid systems (Eivy et al., 2021).

Finally, cost optimisation is considered This hybrid cost strategy can reduce the total cloud expenditure by up to 45 % compared with on-demand-only deployments (Zhang et al., 2022), balancing efficiency with operational flexibility. The savings are a result of having only coverage for predictive basic workload, while spot instances and serverless functions handle burst or event-driven tasks.

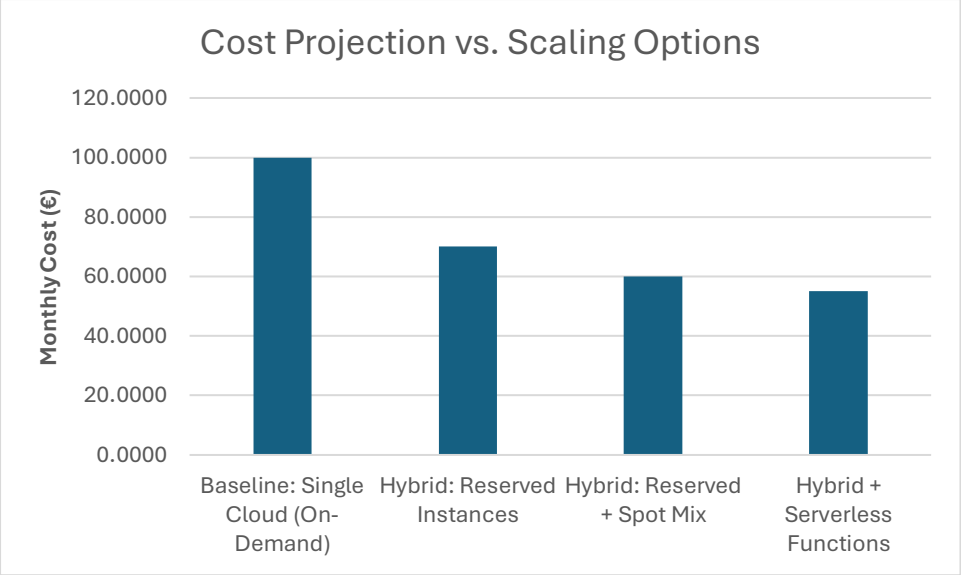

Figure 4: Cost projections showing up to 45% cost savings (Hamberger, 2025)

To sum it up, in designing Evoque Parfums' hybrid cloud infrastructure, security and resilience were treated as foundational principles. This approach aligns closely with the CIA Triad, a framework that ensures Confidentiality, Integrity and Availability in IT systems (Alshamrani, 2022).

- Confidentiality is supported through network segmentation, encryption via KMS, and least-privilege IAM controls.
- Integrity is maintained through Infrastructure as Code (IaC), version-controlled pipelines, and continuous monitoring.
- Availability is achieved via autoscaling groups, content delivery networks, and multi-region failover.

Integration of Advanced Cloud Technologies

The integration of advanced cloud technologies is central to the proposed strategy for the perfume retailer Evoque Parfums, as it combines artificial intelligence (AI), automation, and hybrid architectures to drive both innovation and resilience.

A key component is the personalisation engine, designed to enhance the customer journey through tailored product recommendations across the digital "store". The architecture separates offline and online processes: customer interactions generate event data (clicks and purchases), which are ingested into an ETL pipeline and stored in a feature store. Models are trained in batch mode, versioned within a model registry, and deployed to inference endpoints hosted as stateless microservices or serverless functions. This ensures both scalability and low-latency predictions. Gómez-Uribe and Hunt (2015) argue that hybrid collaborative and latent-factor recommenders deliver measurable increases in engagement and conversion rates.

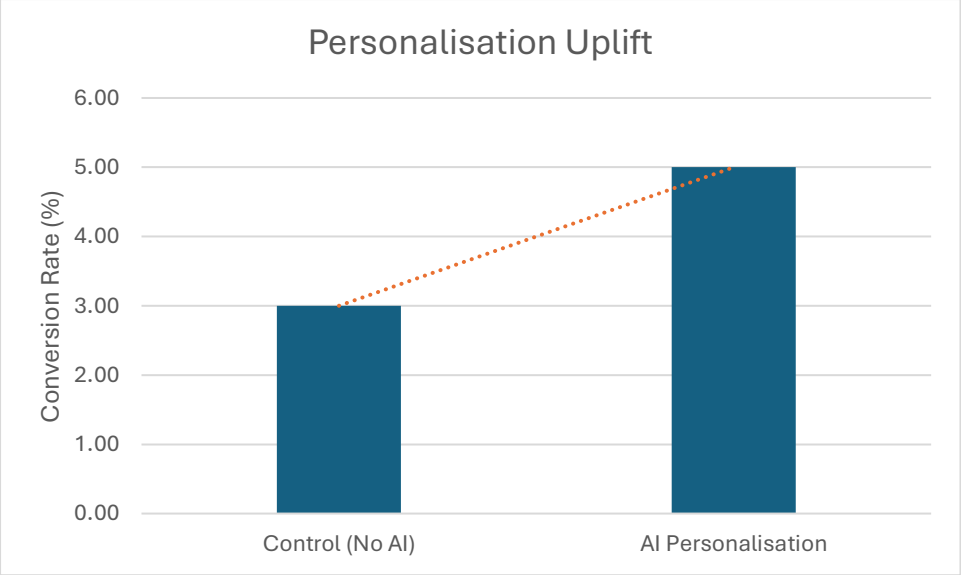

Figure 5: Conversion rate uplift from AI-dribven personalisation (Hamberger, 2025)

Zhao et al. (2021) argue that deep learning approaches, particularly neural collaborative filtering, outperform classical latent-factor models in dynamic retail environments, while Ali et al. (2023) stress that hybrid recommender systems remain more explainable and thus less trustworthy to customers. Figure 6 shows the potential solution from raw events to real-time personalization.

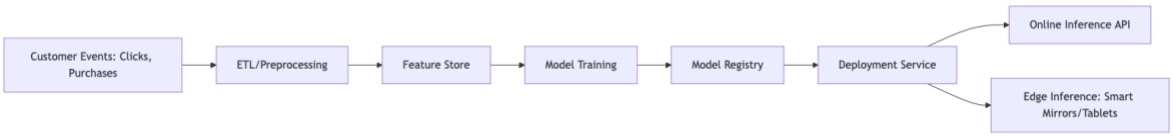

Figure 6: AI-driven personalisation pipeline (Hamberger, 2025)

Finally, hybrid and edge computing plays an important role in bridging online and in-store experiences. For example smart mirrors and tablets in boutiques operate with cached models, reducing inference latency and ensuring continuity even during connectivity disruptions. Zhang et al. (2022) highlight its potential to improve customer satisfaction while lowering bandwidth consumption (Zhang et al., 2022). While Tuli et al. (2022) cautions that model drift and synchronization challenges at the edge require robust monitoring strategies. To minimise operational overhead, the Evoque Parfums may also leverage managed MLOps services allowing teams to focus on business innovation rather than infrastructure management.

Together, AI-driven personalization, automated infrastructure, and edge-enabled hybrid deployments provide a robust technical, but also flexible foundation, which links cloud innovation with measurable business outcomes.

Risk and Compliance

For Evoque Parfums, six risks dominate the IT and Cloud environmet. These risks differ in origin and mitigation, and their relevance becomes clearer when compared to findings from retail studies.

- **Data breach** is the most critical. GDPR requires data minimisation and lawful processing (EUR-Lex, 2016). Recent studies argue that luxury retailers are especially vulnerable because they store high-value customer profiles and purchase histories; a breach damages both revenue and brand prestige (Almorsy et al., 2016). Some authors stress technical controls (encryption, SIEM) while others emphasise governance and consumer trust (Voigt & Von dem Bussche, 2017; Ghasemshirazi, Shirvani and Alipour, 2023). Compared to mass-market retailers, luxury brands suffer proportionally higher reputational losses, making preventative investment justified (Almorsy et al., 2016).
- **Downtime on launch** (e.g., new fragrance release) has immediate commercial impact. Research shows lost availability during peak events causes outsized revenue loss for retail platforms (Consultancy.eu, 2024). Whereas large multi-national retailers absorb some loss through diversified channels, a premium brand with fewer SKUs and high-margin launches is more exposed, therfore strong DR and autoscaling are essential.
- **Supplier disruption** for rare ingredients is a business risk with lower frequency but high impact; supply-chain literature emphasises dual-sourcing and monitoring to reduce vulnerability (Queiroz et al., 2020). Unlike commoditised retailers, Evoque Parfum's product uniqueness increases sensitivity to such disruptions.
- **Vendor lock-in** can hinder strategic flexibility; Zhang et al. (2022) recommend IaC abstraction (Terraform modules) and portable managed services as a mitigation. While some authors argue vendor-specific features improve performance, a luxury retailer benefits from portability to respond to regulatory or cost pressures.
- **Regulatory fines** (GDPR, PCI-DSS) are high-impact, therefore tokenised payment gateways and isolation of cardholder environments reduce risk and liability (PCI SSC, 2022; Tripathi, 2024).
- **Model bias** undermines fairness and can quickly erode a luxury brand's hard-won trust; implementing explainable-AI practices and automated bias-testing pipelines is therefore essential (Floridi & Cowls, 2021).
  Because Evoque Parfums serves a smaller, high-value clientele, biased recommendations can scare key customers and inflict greater reputational and financial harm than they would for mass-market retailers.

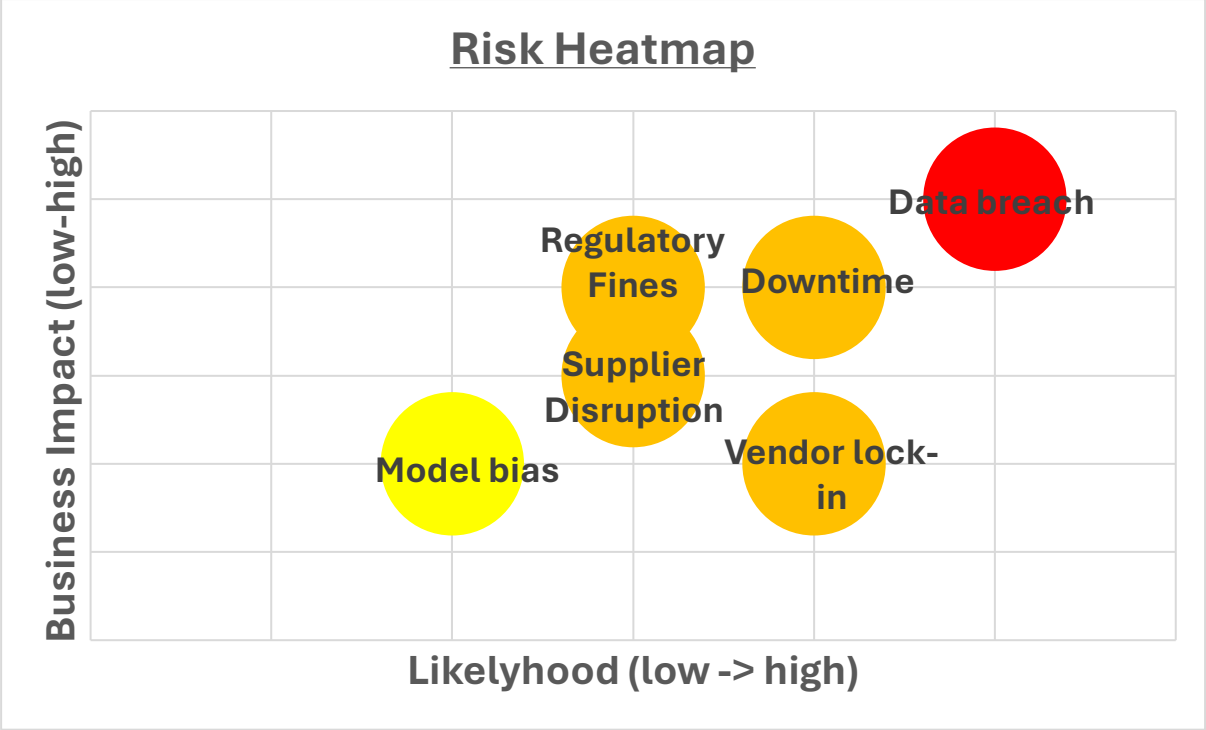

Figure 7: Risk heatmap for Evoque Parfums (Hamberger, 2025)

Prioritised next steps:

1. Conduct a DPIA and deploy consent-management + strong KMS encryption (data breach/regulatory).
2. Move to PCI-tokenised payment provider and isolate cardholder environment (payments).
3. Implement multi-region DR tests and quarterly launch drills (availability) and establish supplier contingency plans (supply risk).

Future Recommendations

Looking forward, Evoque Parfums should prioritise innovation that sustains competitive advantage while aligning with ethical and technological developments. In line with Senyo, Effah and Addae's (2018) Cloud Value Creation Framework, future cloud initiatives should balance technological scalability with organisational readiness and environmental alignment to maximise value.

First, piloting edge deployments in flagship boutiques**,** such as smart mirrors or interactive tablets, would enable recommendations and immersive experiences. Recent studies discuss that edge computing enhances customer engagement and operational efficiency in the luxury market (Kwon, Singh and Kim, 2023).

Second, Evoque Parfums should institutionalise an AI fairness and explainability checklist**.** For high-value clients, transparent algorithms reduce the risk of bias while

reinforcing consumer trust. Emerging research highlights the strategic necessity of embedding fairness audits directly into the ML lifecycle (Mökander et al., 2021).

Finally, Evoque Parfums should explore quantum-ready optimisation for supply chains. Buyya et al. (2017) suggests quantum-enhanced methods could improve resilience in sourcing rare ingredients. Although still experimental, research partnerships in this direction ensures long-term readiness.

Conclusion

To sum it up, if Evoque Parfum adapts the proposed Cloud Strategy, the company has a secure, scalable, and future-ready digital foundation. By integrating hybrid infrastructure, AI-driven personalisation, and robust compliance measures, the Evoque Parfums can meet immediate business needs while safeguarding long-term competitiveness. Future initiatives ensure Evoque parfums remains both innovative and resilient, reinforcing its position as a leader in the luxury perfume market.

Wordcount: 2111

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