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MS3107 - Systems Analysis Report

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"In submitting this work, I confirm that it is entirely my own. I acknowledge that I may be invited to undertake an interview if there is any concern in relation to the integrity of my submission."

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1. Introduction

The rise of financial technology (fintech) has transformed banking, with digital-only solutions challenging traditional financial institutions. This report focuses on the Revolut mobile banking system, a cloud-based business information system that integrates financial services such as instant payments, foreign exchange, cryptocurrency trading, budgeting tools, and business accounts into a seamless digital experience. Unlike traditional banking systems, Revolut operates without physical branches, leveraging an API-driven infrastructure to facilitate real-time transactions across multiple currencies.

Revolut's mobile banking system is designed to provide users with borderless financial management, offering features such as multi-currency accounts and prepaid debit cards. This system enables customers to execute international transfers at interbank rates, automate spending analytics, and access investment opportunities via a single mobile application. The system's architecture is highly modular, integrating third-party financial services through APIs, ensuring scalability, regulatory compliance, and cybersecurity measures. (Rybacki, 2022).

This report aims to analyse the structure and functionality of the Revolut mobile banking system using systems analysis methodologies. The study will evaluate the system's architecture, process flow, and data structure through Level 0 and Level 1 Data Flow Diagrams (DFD) and an Entity-Relationship (E-R) Diagram. Additionally, key challenges such as security, compliance with financial regulations, and customer data privacy will be explored, followed by recommendations for improving system efficiency and governance.

The report is structured as follows:

1. **Organisational Background** – Overview of Revolut's business model, operational structure, and competitive landscape.
2. **System Overview** – Breakdown of Revolut's mobile banking system, including process modelling diagrams and data structures.
3. **Recommendations and Conclusion** – Critical evaluation of the system's security, regulatory challenges, and operational improvements.
4. **References** – A list of academic and industry sources (Harvard style).
5. **Appendix** – Supplementary materials, including interview transcripts and additional diagrams.

By analysing the Revolut mobile banking system, this report will provide insights into the role of fintech in reshaping digital financial services, highlighting both its advantages and limitations in a highly regulated industry.

2. Organisational background

2.1 Overview of Revolut

Revolut is a UK-based financial technology (fintech) company that has rapidly emerged as a leading business information system in the digital banking sector. Since its launch in 2015, Revolut has positioned itself as a challenger bank, aiming to disrupt traditional financial institutions by offering a borderless and fully digital banking experience. According to its co-founder and CEO, Nikolay Storonsky, Revolut's mission is to "unlock a borderless economy", enabling individuals and businesses to trade, invest, and manage finances globally through a single mobile application (Rybacki, 2022). This ambition has led Revolut to become one of the largest fintech banks in Europe, competing directly with both traditional banks and other digital-only financial platforms.

2.2 Business Model and Services

Revolut operates on a dyadic-product business model, providing banking services such as prepaid debit cards, foreign exchange, peer-to-peer payments, cryptocurrency trading, and business banking (Business Model Zoo, 2025). While it presents some characteristics of a platform firm, its primary model remains a dyadic digital-only banking system, allowing customers to make transactions at real exchange rates, manage finances via a mobile app, and access premium features through a subscription-based model (Revolut, 2025).

Every Revolut online bank account is linked to a prepaid debit card (MasterCard or Visa), which is accepted globally. Customers can use the app to exchange currencies at interbank rates, send money through social networks, manage real-time account transactions, and set spending limits (Rybacki, 2022). Revolut generates revenue through subscription plans, including premium, metal, and junior accounts, offering enhanced features such as travel insurance, cashback, and additional security protections (Business Model Zoo, 2025).

Plan	Monthly Fee (approx.)	Key Features
Standard	Free	Multi-currency accounts, prepaid debit card, budgeting tools, limited support
Premium	€7.99	Overseas medical insurance, disposable virtual cards, priority support
Metal	€13.99	Cashback on card payments, airport lounge access
Business	Varies by tier	Multi-user access, invoicing, integration with accounting tools, custom permissions

2.3 Competitive Landscape

Revolut operates in an intensely competitive market, facing challenges from traditional retail banks (e.g., Lloyds, Barclays, HSBC) and currency exchange providers (e.g., Western Union, Post Office, Thomas Exchange), as well as direct fintech competitors such as Monzo, Starling, and N26 (Rybacki, 2022). One of Revolut's key differentiators is its use of the interbank exchange rate, which allows users to make international payments at lower costs compared to traditional banks and fintech providers like PayPal and TransferWise. By removing transaction fees on currency exchanges and international transfers, Revolut has built a strong customer base of individuals and businesses with international financial needs.

2.4 Financial Growth and Expansion

Revolut has witnessed significant financial growth since its inception. In 2019, the company reported a revenue of £12.8 million and processed monthly transaction volumes exceeding \$1.5 billion. By 2020, Revolut had grown its customer base to 10 million users and expanded its operations across the European Economic Area (EEA), Switzerland, and Australia, with plans for further international expansion (Business Model Zoo, 2025).

Revolut's rapid expansion and digital-first approach have positioned it as a dominant player in the fintech industry, providing a scalable, API-driven business information system that challenges traditional banking models. By offering borderless financial services, low-cost transactions, and enhanced digital security, Revolut continues to innovate and disrupt the global financial landscape. However, the company must navigate regulatory challenges, security concerns, and competitive pressures as it seeks to get a foothold in the world of fintech.

3. System overview

3.1 System Architecture and Design

Revolut's mobile banking system is built on a modular, microservices-based architecture that enables the platform to deliver scalable and adaptive digital financial services. Each core function: such as foreign exchange, payments, and cryptocurrency trading, is developed as a separate service and connected through secure APIs. (Application Programming Interface) According to a Product Operations Manager at Revolut, “*each core function is developed independently and integrated via APIs*,” allowing for rapid updates and minimal service disruption.

This API-centric design is a key enabler of Revolut's agility and innovation. APIs facilitate seamless communication between internal services and third-party providers, supporting open banking functionalities and multi-feature integration. APIs are the technological backbone of modern fintech platforms, enhancing data accessibility, interoperability, and service innovation while introducing important security considerations. (Brown and Johnson, 2022)

Revolut also leverages cloud infrastructure to maintain high availability, load balancing, and horizontal scalability across its global user base. This infrastructure supports real-time processing of high transaction volumes and allows services to scale independently based on demand. Modular architecture also supports Revolut's ability to introduce and test new features, such as sandbox environments and SME business accounts, without affecting core operations.

This design aligns with industry best practices and reflects Revolut's commitment to building a resilient, secure, and responsive financial system capable of adapting to evolving regulatory and market demands.

3.2 Requirements Elicitation and User Feedback

Revolut employs a highly agile and data-driven approach to requirements gathering, aligning closely with the requirements phase of the Systems Development Life Cycle (SDLC). According to a Product Operations Manager at Revolut (interviewed on 27 March 2025), the company gathers user requirements through multiple feedback channels, including in-app surveys, Net Promoter Score (NPS) tracking, usage analytics, and App Store reviews. These inputs are continuously monitored and fed into development sprints to prioritise features and optimise user experience.

This iterative and user-centred process supports continuous improvement and responsiveness to customer needs. It also reinforces Revolut's commitment to delivering tailored digital banking solutions in a rapidly evolving financial landscape. Data science and AI techniques are central to this feedback loop. Smart FinTech systems use behavioural analytics and real-time data to dynamically adjust to customer preferences and improve service offerings. This enables firms like Revolut to move beyond static requirement sets and adopt adaptive strategies for feature development and user interface enhancements.

Together, these practices ensure that Revolut's system requirements are not only relevant and up to date but also rooted in real-world user behaviour and expectations.

3.3 Business Process Modelling

3.3.1 Level 0 DFD

This Level 0 Data Flow Diagram (DFD) provides a high-level overview of Revolut's mobile banking system, illustrating the main processes involved in account creation, transaction execution, and balance inquiries. The external entity, the customer, interacts with the system by submitting registration information, initiating transactions, and requesting balance checks. These interactions are processed through three core functions within the system: "Create Account," "Make Transaction," and "Check Balance." Each process exchanges data with associated data stores—User Profile DB, Transaction DB, and Account Balance DB—ensuring accurate storage and retrieval of user data, transaction records, and account balances.

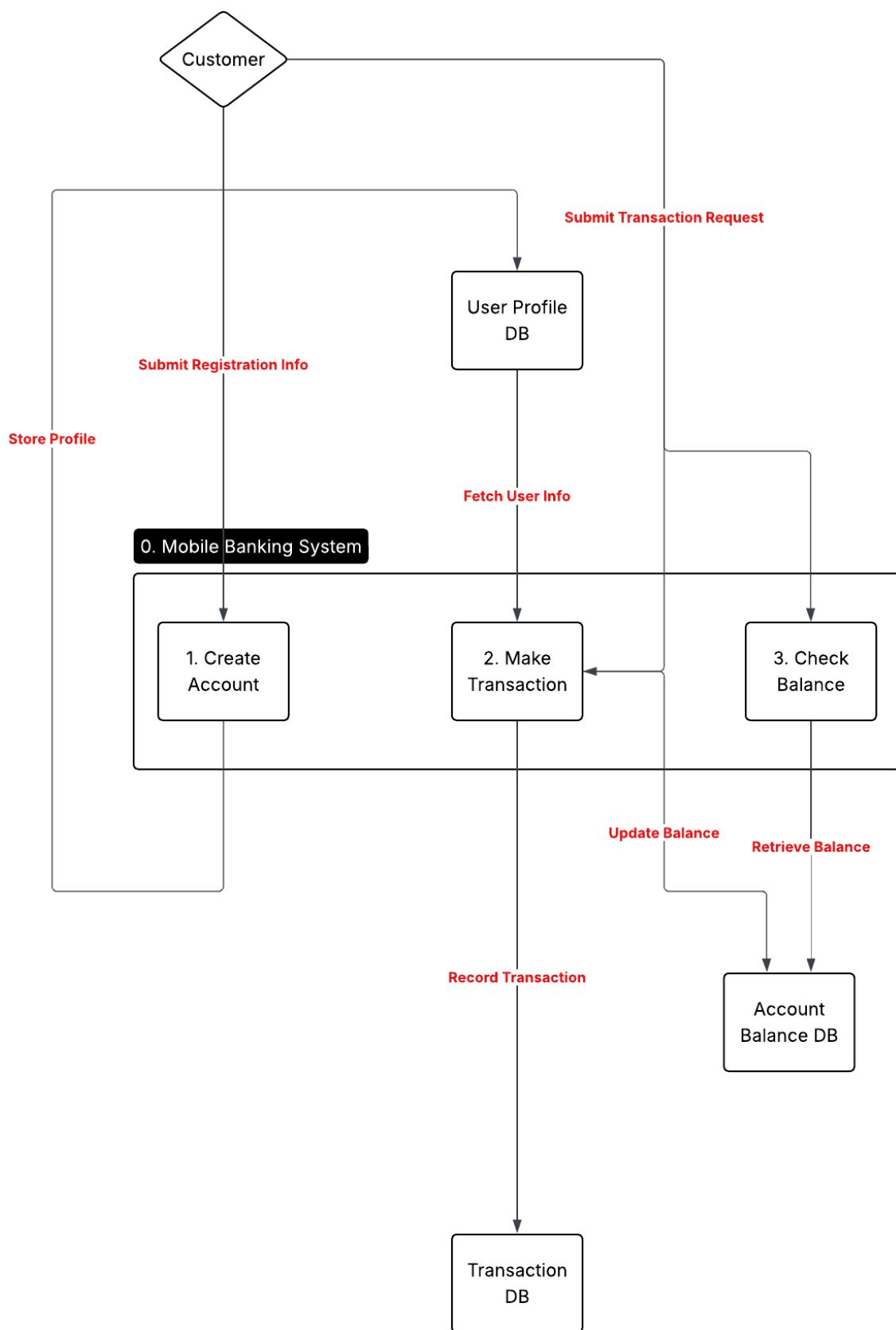


Figure 1: Level 0 DFD Diagram for Revolut's mobile banking system. Made via Lucidchart.

3.3.2 Level 1 DFD

This Level 1 DFD expands on the “Make Transaction” process from the Level 0 diagram, detailing the key steps involved in securely processing a payment. The process begins with the customer submitting a transaction request, which triggers user authentication (2.1) and validation of transaction details (2.2). These steps ensure the legitimacy of the transaction and the accuracy of the input. Once validated, the system processes the payment (2.3), and updates relevant records (2.4), including the user's account balance and the transaction log. Data flows between sub-processes and connected data stores—User Profile DB, Account Balance DB, and Transaction DB—ensure the accurate and secure handling of financial information.

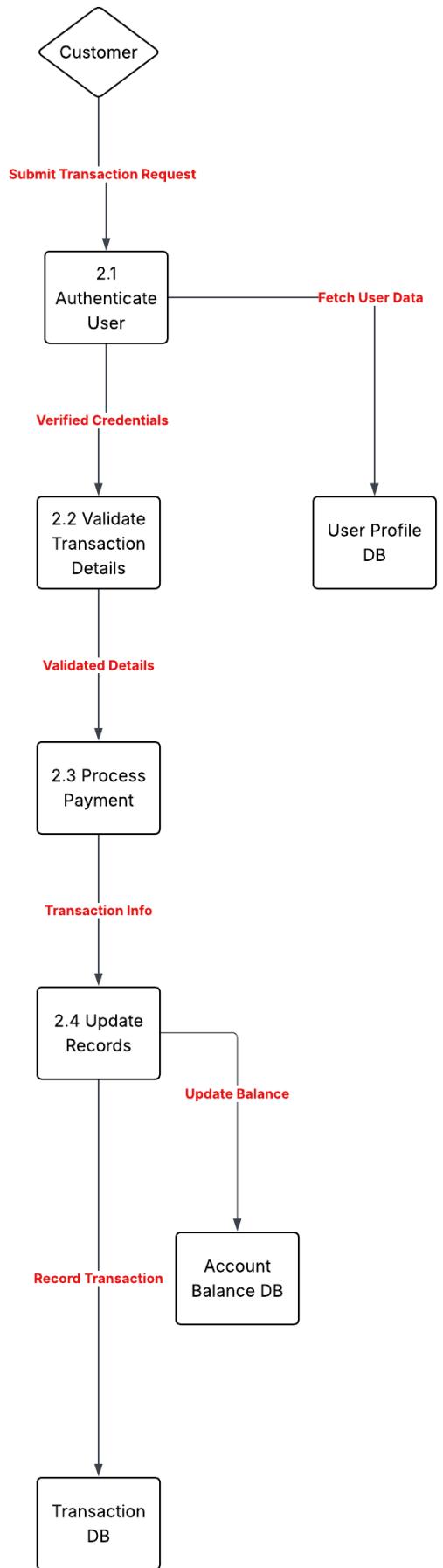


Figure 2: Level 1 DFD Diagram for Revolut's mobile banking system. Focusing on Make Transaction. Made via Lucidchart.

3.4 Conceptual Data Modelling

Revolut's database is structured to support key user-facing operations such as account management, transactions, subscriptions, and card linking. A user can hold multiple accounts and initiate transactions in different currencies, with each transaction tied to an account and currency. KYC status is stored within the User entity to control access based on verification. SubscriptionPlan and BusinessProfile entities reflect premium and business user options. Relationships are normalized to ensure data consistency and support Revolut's modular, API-driven architecture.

3.4.1 E-R Diagram

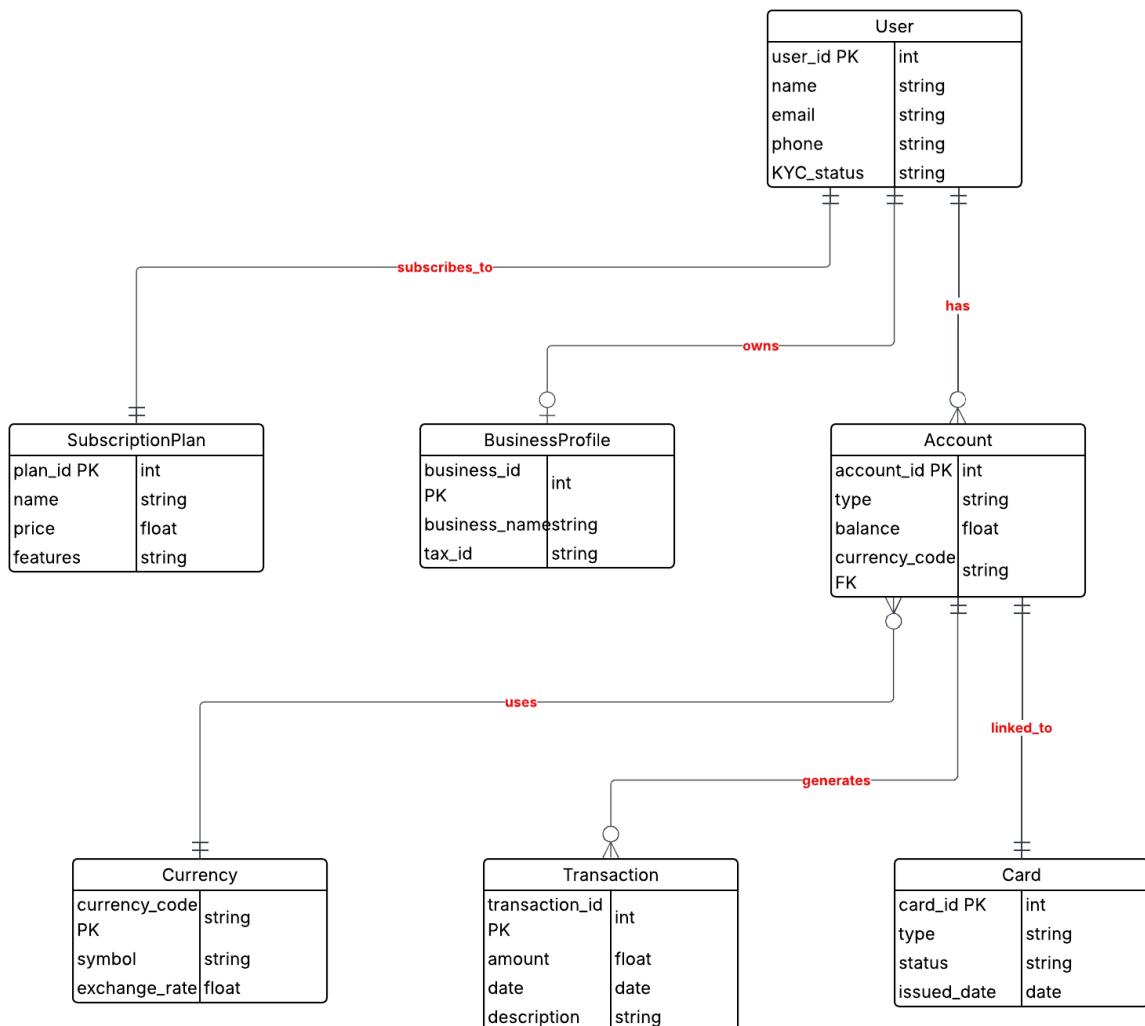


Figure 3: Entity-Relationship Diagram for Revolut's mobile banking system. Starting with the User. Made via Lucidchart.

4. Recommendations and Conclusion:

This section provides a critical evaluation of Revolut's mobile banking system. It highlights core areas of concern and offers targeted recommendations to improve operational efficiency, regulatory compliance, and user trust. The analysis focuses on key system-level challenges including data security, evolving financial regulations, and the scalability demands of Revolut's global expansion. Drawing on insights from academic literature and real-world observations, the recommendations aim to support Revolut's continued growth as a secure and adaptable digital banking platform.

4.1 Security Threats

Security is a core pillar of Revolut's mobile banking infrastructure, which operates exclusively through digital channels. The Revolut app implements robust safety features such as fingerprint identification, 3D Secure (3DS) authentication, and disposable virtual cards, offering enhanced protection against phishing, card theft, and unauthorised transactions (Jitaru and Bodnar, 2021). The platform also allows users to toggle card functionalities like contactless or ATM usage, providing granular control over risk exposure.

Revolut's Sherlock anti-fraud system enables real-time detection of suspicious activity, alerting internal teams instantly and allowing rapid response to fraud attempts. These measures align with modern fintech security practices, prioritising prevention and responsiveness. Additionally, the platform's geolocation tracking ensures contextual validation of transactions — blocking payments if the card and phone appear in different regions (Jitaru and Bodnar, 2021).

While Revolut has not experienced major public data breaches to date, the company acknowledges that no system is completely immune to threats. Therefore, continued investment in independent audits, customer awareness, and backend security infrastructure is essential to maintaining trust and compliance as Revolut scales globally.

4.2 Regulatory Compliance

Regulatory compliance remains one of the most pressing challenges for Revolut as it transitions from a fintech disruptor to a fully licensed bank. The company's pursuit of a European Banking License offers several advantages, including access to deposit protection under the European Deposit Protection Scheme (EDPS) and the ability to offer personal loans, interest-bearing accounts, and overdrafts (Vilkinis and Vasciula, 2018). However, this comes at the cost of increased regulatory scrutiny and the need for stricter Know Your Customer (KYC) protocols. Delays in Revolut's UK license highlight deeper concerns about its internal governance, with recent media reports noting issues around financial reporting and leadership turnover (Vander Weyer, 2023). To address this, Revolut should enhance transparency in its regulatory dealings, ensure consistent internal audits, and strengthen its compliance leadership team. Furthermore,

the opportunities presented by the Second Payment Services Directive (PSD2) (such as open access to financial data) must be balanced against the risk of competition from Big Tech firms with superior data infrastructure (Vilkinis and Vasciula, 2018). Revolut must future-proof its operations by embedding regulatory flexibility into its architecture and maintaining close engagement with regulators across key markets. Failure to do so could stall its growth ambitions and weaken its credibility as a trusted financial institution.

4.3 Competitors and market disruption

Revolut entered the financial services industry in 2015 and quickly disrupted the traditional banking model by offering borderless, digital-only banking through a streamlined mobile platform (Vilkinis and Vasciula, 2018). By eliminating branch-based services and providing fee-free currency exchange, cryptocurrency trading, and instant peer-to-peer transfers, Revolut appealed to underserved customer segments that traditional banks often overlooked. This strategy aligns with the theory of disruptive innovation, where new entrants gain traction by targeting niche markets with simplified and affordable solutions. Over time, Revolut's offering expanded to premium services, business accounts, and wealth management, increasing its appeal to higher-value users and positioning it as a competitive threat to both legacy banks and fintech peers like Monzo, N26, and Starling. However, as the industry continues to shift driven by regulatory change (e.g., PSD2) and the emergence of Big Tech platforms in finance, Revolut must now defend its own position as a disruptor. To maintain its competitive advantage, Revolut should continue to differentiate through innovation and agility while investing in ethical data usage, transparent pricing, and robust customer support. Strategic alliances and interoperability will be key to surviving in an increasingly crowded digital financial landscape.

Feature	Revolut	Monzo	N26	Apple
Crypto Support	✓	✗	✓	✗ (as of 2025)
Business Accounts	✓	✓	✓	✗
Interbank FX Rate Access	✓	✗	✓	✗
Subscription Tiers Available	✓	✓	✓	✓
Physical Branches	✗	✗	✗	✗

Fintech vs. Big Tech: Competitive Feature Comparison

4.4 Conclusion

Revolut has established itself as a disruptive force in the digital banking sector through its agile, API-driven infrastructure and customer-centric innovation strategy. While its modular system architecture allows for rapid development and global scalability, the company must continue to address growing regulatory scrutiny, competitive pressures, and evolving security threats. As noted by a Product Operations Manager, Revolut constantly tries to balance innovation with risk mitigation. Moving forward, continued investment in compliance infrastructure, transparent security practices, and customer trust will be essential. With strong strategic alignment to the

Software Development Life Cycle (SDLC) and emerging regulatory frameworks like PSD2, Revolut is well-positioned to maintain its competitive edge — provided it reinforces its operational resilience and governance as it scales into new markets.

5. References:

- Brown, E. and Johnson, M., 2022.** *API-Driven Fintech: Enhancing Data Access and Security in Financial Services*. Advances in Computer Sciences, 5. Available at: <https://academicpinnacle.com/index.php/acs1> [Accessed 1 Apr. 2025].
- Business Model Zoo, 2025.** *Revolut*. [online] Available at: <https://www.businessmodelzoo.com/exemplars/revolut/> [Accessed 15 Mar. 2025].
- Cao, L., Yang, Q. and Yu, P.S., 2021.** Data science and AI in FinTech: an overview. *International Journal of Data Science and Analytics*, 12, pp.81–99. Available at: <https://doi.org/10.1007/s41060-021-00278-w> [Accessed 1 Apr. 2025].
- Jitaru, M. and Bodnar, A., 2021. *Security analysis – Revolut*. [pdf] Alexandru Ioan Cuza University. Available at: <https://doi.org/10.13140/RG.2.2.33681.25440> [Accessed 1 Apr. 2025].
- Lucidchart, 2025.** *Diagram Maker - Create Diagrams Online*. [online] Available at: <https://www.lucidchart.com/pages/examples/diagram-maker> [Accessed 25 Mar. 2025].
- Product Operations Manager at Revolut, 2025.** Interview with Jack Bates, 27 March. Conducted via Microsoft Teams.
- Revolut, 2025.** *About Us*. [online] Available at: <https://www.revolut.com/about/> [Accessed 15 Mar. 2025].
- Rosati, P., 2024.** *MS3107 - Topic 6 - Project Selection & BPM*. University of Galway. Available on Canvas. [Accessed 25 Mar. 2025].
- Rosati, P., 2024.** *MS3107 - Topic 7 - Conceptual Data Modelling*. University of Galway. Available on Canvas. [Accessed 25 Mar. 2025].
- Rybacki, P., 2022.** *Revolut's Revolution: The Rise of a Digital Bank*. Available at: <https://knowledge.uchicago.edu/record/4259?v=pdf> [Accessed 15 Mar. 2025].
- Vander Weyer, M., 2023.** *Regulators should not roll over for arrogant Revolut*. *The Spectator*. Available at: https://go.gale.com/ps/i.do?id=GALE%7CA760659688&sid=googleScholar&v=2.1&it=r&linkaccess=abs&issn=00386952&p=AONE&sw=w&userGroupName=nysl_oweb&aty=ip [Accessed 1 Apr. 2025].
- Vilkinis, T. and Vasciula, T., 2018.** *A Case Study of British Fintech Startup Revolut*. Master's thesis. Copenhagen Business School. Available at: https://research-api.cbs.dk/ws/portalfiles/portal/59754566/576606_Master_thesis_final_version.pdf [Accessed 29 Mar. 2025].

6. Appendix

Appendix A: Diagrams

Sequence Diagram: Make Payment

This sequence diagram illustrates the end-to-end process of executing a payment within the Revolut mobile application. The user initiates the transaction via the application UI, which triggers authentication through the AuthService. Upon successful verification, the payment details are submitted to the Transaction Engine, which validates the user's balance and forwards the request to the external BankAPI for processing. Once confirmation is received, the system returns the payment status and displays a confirmation to the user. This diagram highlights the interaction between core components and the order of operations required for secure and efficient transaction processing.

Lifelines

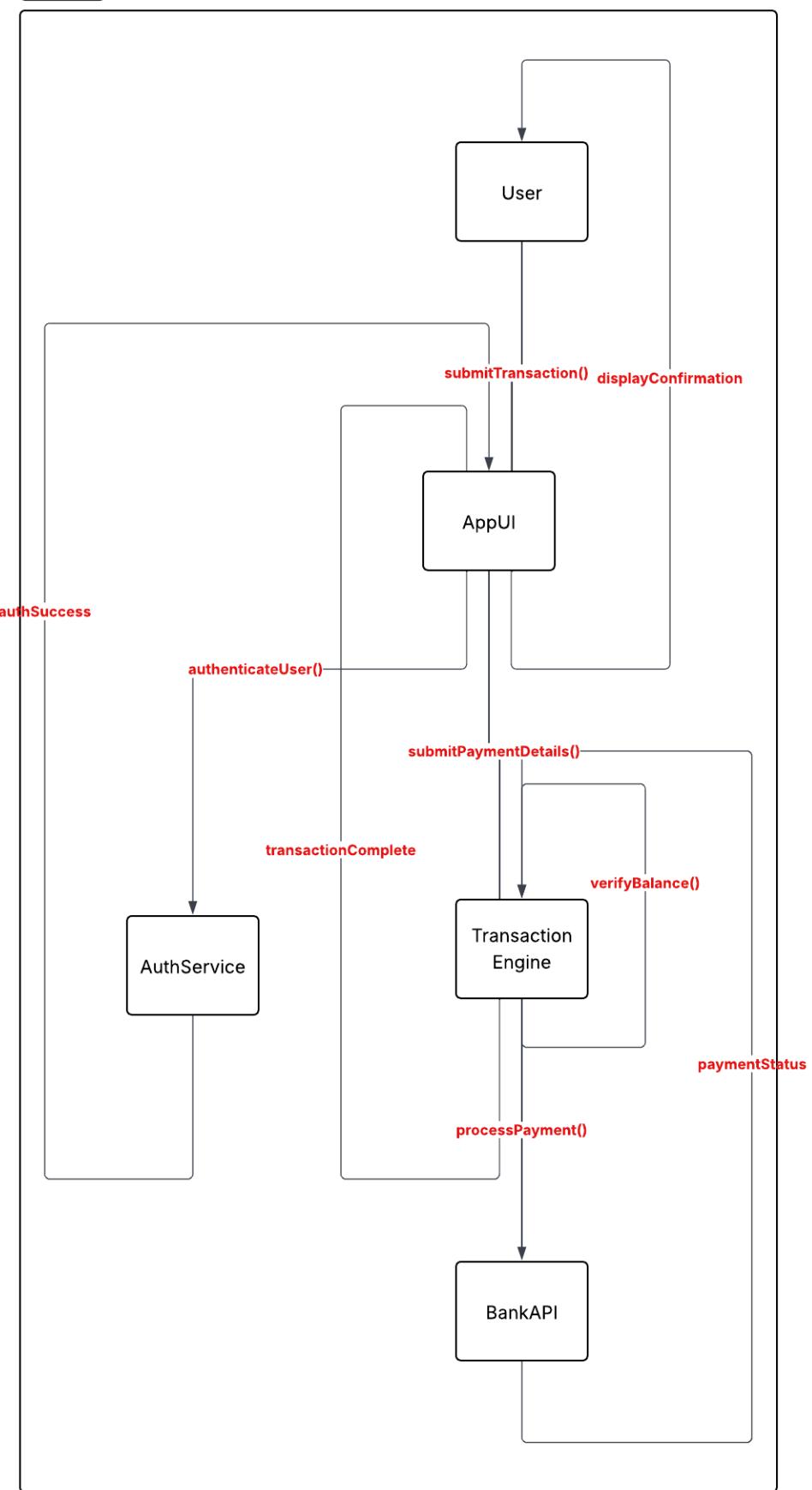


Figure 4: Sequence Diagram: User Makes a Payment in Revolut Mobile App. Made via LucidChart.

Use Case Diagram: Core User Interactions

This use case diagram represents the primary interactions between Revolut users and the mobile application. The diagram identifies key actions such as registering an account, making payments, exchanging currencies, and managing card settings. Additionally, it includes customer support access and administrative interaction by the System Admin. These use cases reflect typical behaviours expected in a mobile-first digital banking environment, emphasising usability, autonomy, and support escalation.

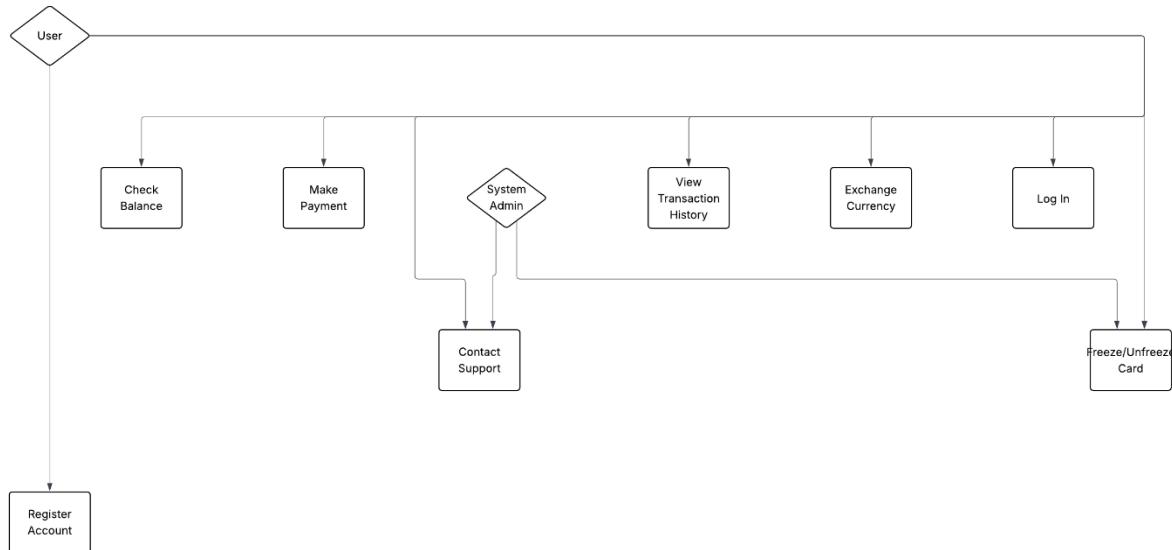


Figure 5 – Use Case Diagram: Revolut Mobile App Functionalities. Made via Lucidchart.

Appendix B: Interview Notes

Interviewee: Nameless (*Product Operations Manager at Revolut*)

Date: March 27, 2025

Platform: Microsoft Teams

Purpose: To gain firsthand insight into the structure and operation of Revolut's mobile banking system, with a focus on system architecture, requirements elicitation, security, and regulatory challenges.

Key Insights from the Interview

The following summarises key points from a recorded interview conducted via Microsoft Teams on March 27, 2025, with a Product Operations Manager at Revolut. The transcription has been paraphrased and structured to highlight system-related insights relevant to this report.

1. System Structure

Revolut operates a modular, microservices-based system. Each major function; such as foreign exchange, payments, and cryptocurrency, is developed independently and integrated via secure APIs. This architecture supports rapid updates, scalability, and minimal downtime during maintenance.

2. Requirements Gathering

User requirements are gathered using a data-driven approach. Feedback mechanisms include:

- In-app surveys
- Net Promoter Score (NPS) tracking
- Usage analytics
- App Store reviews

These insights inform development priorities and are fed into short development sprints for continuous improvement.

3. Key Challenges

- **Regulatory Compliance:** Revolut must adapt to shifting financial regulations across jurisdictions, requiring constant system updates and legal oversight.
- **Fraud Prevention:** Advanced behavioural analytics and real-time monitoring are used to detect suspicious transactions.
- **Customer Trust:** In the absence of physical branches, trust is maintained through transparent communication and robust security features.

4. Security Measures

Revolut embeds security at all levels of its system architecture, employing:

- End-to-end encryption
- Biometric login and device authentication
- Strict internal access controls
- Automated fraud flagging and regular internal audits

These insights support the system evaluation in this report and highlight practical applications of system design and security strategies within a high growth fintech environment.