



Fintech & Trust: A Game-Changer for Neobanks in Germany

Federico Bonanno

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ABSTRACT

Title: Fintech & Trust: A Game-Changer for Neobanks in Germany

Author: Federico Giovanni Davide Bonanno

Throughout the last decade, the fast-paced and disruptive technological developments have brought major changes in the banking industry, further promoting digitalization and the establishment of internet-only based neobanks.

However, neobanks have raised concerns about data-handling, privacy and security-related risks, severely compromising their trustworthiness. Hence, they focus on providing unique customer experiences by including practical digital banking features in their value proposition. Also, they tackle environmental challenges and contribute to the achievement of the SDGs.

Based on previous literature, an experimental study was conducted to examine the role of digital banking features regarding the trust perception among users and non-users towards neobanks in Germany, and the impact usage experience and digital affinity have on those trust levels.

Results confirm the presence of links between six out of eight assessed features (*Instant Push Notifications, Free Payments and Money Withdrawals Globally, Spending Analysis, Immediate Money Transfer, Customer Service, and Impact Measurement of SDGs Contribution*) and trust, both among users and non-users of neobanks. Moreover, findings point to age-specific and experience-based variation in the influence of definite digital banking features on trust levels.

Accordingly, the research supports neobanks in understanding which features to incorporate in their product portfolio and how to address customers' needs and trust concerns.

This dissertation provides significant academic and managerial implications, highlighting how digital banking features are valued in relation to trust, in Germany. Additionally, it presents important contributions for existing and upcoming players that want to gain in-depth insights about people's trust perception to effectively plan future strategic endeavors.

Keywords: Neobanks; Trust; Digital Banking Features; Customer Experience; Germany; Age; Users; Potential Adopters; Sustainability; Digital Affinity

SUMÁRIO

Título: Fintech & Confiança: Um Trunfo para Neobanks na Alemanha

Autor: Federico Giovanni Davide Bonanno

Durante a última década, a acelerada evolução tecnológica introduziu grandes mudanças no sector bancário, acentuando a digitalização e o estabelecimento de *neobanks*.

Contudo, as preocupações relativas ao tratamento de dados, privacidade e riscos de segurança comprometeram gravemente a sua fiabilidade. Deste modo, os bancos digitais focaram-se em proporcionar experiências únicas aos clientes, incluindo na sua oferta funcionalidades digitais relevantes. Ademais, apoiando desafios ambientais e contribuindo para a realização dos ODS.

O presente estudo visa compreender o papel que características de *neobanks* têm na perceção de confiança entre utilizadores e não-utilizadores face aos mesmos na Alemanha, bem como o impacto que a experiência de utilização e afinidade digital têm nesses níveis de confiança.

Os resultados confirmam a presença de relações entre seis das oito características avaliadas (*Notificações Instantâneas, Pagamentos e Levantamentos Internacionais Gratuitos, Análise de Despesas, Transferência de Dinheiro Imediata, Serviço ao Cliente, e Medição do Impacto da Contribuição dos ODSs*) e o nível de confiança, tanto entre utilizadores como não-utilizadores de *neobanks*. Além disso, verifica-se o impacto que a idade e experiência têm nos níveis de confiança, ligados a funcionalidades bancárias digitais.

Este estudo contribui para investigação científica de *neobanks*, salientando características a incluir na sua oferta e como abordar as necessidades dos usuários e preocupações de confiança.

Esta dissertação expõe implicações teóricas e práticas de gestão significativas, realçando o papel de características bancárias digitais na medição de confiança. Adicionalmente, proporciona um conhecimento adicional a gestores relativamente à perceção de confiança, facilitando o planeamento de estratégias futuras.

Palavras-Chave: *Neobanks*; Confiança; Funcionalidades Bancárias Digitais; Experiência do Cliente; Alemanha; Idade; Usuários; Potenciais Usuários; Sustentabilidade; Afinidade Digital

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Ad maiora!

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LIST OF ABBREVIATIONS

AI	Artificial Intelligence
API	Application Programming Interface
ATM	Automated Teller Machine
CAGR	Compound Annual Growth Rate
CE	Customer Engagement
CX	Customer Experience
DB	Digital Banking
DKB	Deutsche Kreditbank
ESG	Environmental Social Governance
EU	European Union
GVR	Grand View Research
HP	Hypothesis
HSD	Honestly Significant Difference
LR	Literature Review
MB	Mobile Banking
OB	Online Banking
PC	Personal Computer
PDA	Personal Digital Assistant
RQ	Research Question
SDG	Sustainable Development Goals
SMS	Short Message Service
UK	United Kingdom
UX	User Experience
WTP	Willingness to Pay

I. INTRODUCTION

1. Research Topic and Problem

In the increasingly globalized and interconnected world of today, the rise of digitalization and transformational technologies has disrupted entire industries (Ciunova-Shuleska et al., 2021). Particularly the banking sector has experienced substantial changes, growing by 34% from a worldwide market capitalization of \$5.6 to \$7.5 trillion between 2016-2021 (Statista Research Department, 2022). These developments have drastically increased the usage of smartphones, expected to reach nearly 7.7 billion subscriptions globally by 2027 (Ericsson, 2022), and have led to the establishment of neobanks, which operate solely via mobile applications and without physical branches (Likuev & Bermisheva, 2017).

In an attempt to provide users with unique customer experience (CX), major benefits of neobanks include an extremely simplified and 100%-online account creation method, which can be completed from anywhere at people's convenience, the comfort of making international payments (Shabu & Ramankutty, 2022), and a huge assortment of digital banking (DB) features directly in the app. However, neobanks also have a few disadvantages and are plagued by trust-related risks, such as privacy and security concerns of personal data, cyber-attacks, and misuse of customers' funds. This can heavily damage their reputation and reduce adoption rates, diminish their competitive advantage over traditional banks, and ultimately lead to default and bankruptcy (Temelkov, 2022).

The level of trust users place on neobanks' service offering is of extreme importance, as more reliance leads to higher adoption and heavily impacts the relationship with customers. Today, consumers' behaviors are changing as they demand a more user-friendly and networked experience that, alongside trust, provides greater transparency and interactivity. Poorly designed platforms and applications will erode trust towards neobanks, which consequently must seek to deliver a fantastic CX, focusing on user-specific and value-added solutions and tailored personalization opportunities (Kaabachi et al., 2019). Hence, trust is a strong and must-have differentiation factor in the banking sector (Amegbe & Osakwe, 2018).

In line with the aforementioned factors, the main objective of the present paper is to understand the role of DB features in bolstering trust for neobanks. Specifically, the study intends to reduce the gap of existing literature regarding the relationship between neobanks' structure and trust

build-up, add value to customer perception knowledge, and create new information sources for industry professionals.

2. Research Question

The RQ aims to comprehend to which extent DB features (i.e., instant push notifications, free payments and money withdrawals worldwide, spending analysis, immediate money transfer, customer service 24/7) influence the trustworthiness of neobanks.

RQ 1: Do DB features lead to high or low trust between users and non-users of neobanks?

3. Dissertation Structure

The dissertation comprises five chapters, starting with an outline of the study's main topic, the underlying research problem, and the research question. The second chapter presents an overview of existing literature in the field, highlighting the key topics for the study in question and delineating the hypotheses. Subsequently, chapter three describes the applied methodology and the followed steps of the data collection procedure. Chapter four provides an in-depth analysis of the results. Lastly, chapter five portrays various conclusions and implications of the findings in conjunction with limitations and suggestions for future investigation.

II. LITERATURE REVIEW

1. History of Banking Industry

Historically, traditional banking embraces four main characteristics: relationship loans (i.e., loans provided to individuals or businesses that pertain to a portfolio rather than securitized), core deposits (i.e., funding based on transactions, savings, and small time-deposits rather than purchased funds), revenue streams from traditional banking services (e.g., net interest margins, deposit charges, investment banking), and physical bank branches (Chiorazzo et al., 2018).

Approximately twenty years ago, with the advent of globalization and increasing competitiveness, new strategies to attract and keep customers became of utmost importance. With the rise of the internet, consumers drastically changed their way of interacting with banks. The industry switched from traditional branch- to more stand-alone-banking, using electronic delivery channels (e.g., PC, telephone, mobile phones) in private banking (Karjaluo et al., 2002). This represented a major breakthrough for users, who could execute banking actions without being

physically in a branch (Osunmuyiwa, 2013). Also in Europe, the internet has quickly emerged as a widely recognized distribution channel, both for traditional banks and new players, who have discovered its huge potential due to its universal connection, making it an invaluable asset compared to other technologies (Boskov, 2019). In fact, a radical shift in user behavior was noticeable, as more customers started using online services rather than going to branches. Consequently, banks were forced to close their subsidiaries (BBC, 2016; French et al., 2013). Due to higher adoption of electronic payments and online banking (OB), nearly 9.100 branches were shut down only in the EU by the end of 2016 (Sanmath, 2018).

Throughout the last decade, instead, with the increased usage of mobile phones, another delivery channel has arisen: mobile banking (MB) (Sha & Mohammad, 2017). Literature has defined MB as a “channel whereby the customer interacts with a bank via a mobile device (e.g., mobile phone, PDA)” (Barnes & Corbitt, 2003, p. 275), which represents a powerful mechanism for developing strong relationships between clients and financial institutions (Jun & Palacios, 2016). Initially deployed in European countries (Shaikh & Karjaluoto, 2015), MB has evolved into one of the most imperative technological innovations of the banking sector (Sharma & Sharma, 2018), expected to reach over 2.5 billion users in 2024 (Juniper, 2021). As a result, traditional banks have progressively moved towards more specific services within mobile eco-systems (Albashrawi et al., 2019), boosting efficiency by saving time and money (Malaquias & Hwang, 2016). However, the development of such strategies requires massive upfront investments: research suggests that banks have invested funds of \$115 billion worldwide (Baabdullah et al., 2019).

Moreover, the global financial crisis in 2008 undoubtedly marked a turning point in the banking industry in many developed countries. The tragedy exposed the vulnerabilities of traditional banks' operations, and government bailouts and public scandals resulted in a tremendous loss of trust (Hopkinson & Klarova, 2019). Indeed, the banking sector was plagued by the lack of new entrants (Temelkov, 2020), as they directly competed with highly developed and well-established institutions that benefited from huge amounts of capital, vast networks, and sophisticated infrastructure (Hopkinson & Klarova, 2019).

Nonetheless, new technologies wiping through the financial industry have changed traditional banking structures and paradigms (Windasari et al., 2022). Factors such as OB, self-service machines, and 24-hour customer service have increased the need for DB (Chauhan, 2018), as

these services were only available inside bank branches. Thus, DB is defined as the “frontier innovation of banking activities and financial services” (Windasari et al., 2022, p. 1).

2. Rise of Neobanks

As briefly mentioned beforehand, the financial industry has experienced substantial disruption during the last decade, changing consumer behavior, creating innovative technologies, and providing new products and services (Baptista & Oliveira, 2016; Malaquias & Hwang, 2016). Especially the usage of electronic applications and artificial intelligence (AI) had a phenomenal impact on many existing companies and led to the generation of new business models (Raghubansie, et al., 2015; El-Gohary, 2011). Through AI, firms can operate 100% digitally, even in industries previously assumed impossible, and provide a unique CX across the value proposition (Hoyer et al., 2020; Ameen et al., 2021).

This phenomenon is also present in the financial sector, specifically in banking. There is a growing trend in the development of branchless banks, which operate in an entirely virtual way and customers can manage all activities via mobile platforms. Accordingly, users can access the financial application via smartphone with no brick-and-mortar and physical contact (Windasari et al., 2022). These types of banks are named *neobanks*, which are 100% digital-only banks and are built on cutting-edge technology and infrastructure (Likuev & Bermisheva, 2017). They are bank-like providers of financial services and aim to attract various consumer segments via innovative features and elegant design (Bradford, 2020). The outstanding attributes of neobanks are their mere reliance on cloud-based software, absence of branches, adaptability, and effective usage of data-driven innovation (Kline, 2015; Bradford, 2020). They also provide similar services as traditional banks (e.g., savings accounts, credit cards, paper checks), allowing users to switch their primary bank account (Kauflin, 2019; Temelkov, 2020).

The origin of neobanks goes back to 1989, when First Direct first provided such a service via a call center model in the UK. Afterwards, firms started to incorporate internet banking, until traditional banks added DB to their business units in the 2000s to sustain the fast development in technology. In fact, it was only in the 2010s when neobanks hit the headlines (Okunevych & Hlivecka, 2018). Advantages include high interest-rates on deposits, as they work without branches and have fewer employees, low service fees, simplified credit rating assessment due to automated technologies used for the verification of customer information, and tools for financial analytics (Koibichuk et al., 2021). Neobanks easily create a fantastic CX (El-Gohary

et al., 2021) by being completely paper- and signature-less (Windasari et al., 2022), and thus quickly attract new users and expand their customer base in a rather short time (Temelkov, 2022). Adoption rates of DB have increased to an extent that users believe to have comparable interaction levels as with social media (Dootson et al., 2016).

Neobanks have revolutionized traditional banking by offering Banking-as-a-Platform, building service environments around their technological infrastructure and shifting the focus from branches to API layers (Finnovate, 2018). By collaborating with chartered banks, which are licensed by governments, they have the legitimacy to provide financial services (Bradford, 2020) such as safeguarding deposits, issuing loans, wealth management, and currency exchange (Kagan, 2022). Alternatives include the operation without a full banking license or possess one for individual financial services (Koibichuk et al., 2021). However, besides offering excellent CX, they fall short on cross-selling and lending (Menon, 2018), and face privacy-, security-, and performance-related risks for users (Mbama & Ezepue, 2018; Alkhowaiter, 2020). Depending on the resident jurisdiction's laws, neobanks are limited in their service offering (Lumpkin & Schich, 2020). Specific loans and deposit schemes are unavailable and need to be developed with greater acceptance and transparency (Shabu & Ramankutty, 2022).

After the first three quarters in 2019, neobanks have received \$2.9 billion of funding by venture capitalists, compared with \$2.3 billion during whole 2018 (Koibichuk, 2021). Today, they show immense growth rates, and expectations regarding their future development are highly positive (Temelkov, 2022). According to a study performed by GVR (2022), the projected global neobank market will be almost \$67 billion by the end of 2022, forecasted to grow at a tremendous CAGR of 53.4% until 2030, reaching a total valuation of \$2.05 trillion.

3. Industry Analysis

3.1 Leading Neobanks in Europe and Germany

Nowadays, the worldwide DB sector is fiercer than ever: while in 2019 only 70 neobanks existed globally (Glushchenko, 2019), today over 300 (Exton Consulting, 2021) are competing to provide clients the best service and CX. Unique features and state-of-the-art technology are two main ingredients for neobanks to build a strong and loyal customer base and to differentiate themselves from competitors. But which are the major players in the European and German market?

N26

Founded in 2013, headquartered in Berlin, and steered by a truly entrepreneurial mindset, which led to the initial product launch in 2015, N26 still has its mission at its core: “building the first mobile bank the world loves to use” (N26, 2021). With avant-garde technology, a European banking license, and a fully branchless network, N26 has revolutionized how people interpret and live banking. Today, it counts over 7 million customers in 24 markets worldwide and focuses on providing users a simple, accessible, and transparent way to manage their money. By setting up an audacious vision, adapting the business to effectively respond to market movements, and putting customer satisfaction first, N26 almost triplicated its value from \$3.5 billion (McKinsey, 2021) to \$9 billion in less than a year, slightly surpassing Commerzbank (\$8.8 billion), Germany’s second-largest bank, by market capitalization (Browne, 2021).

Revolut

Launched in 2015, Revolut is a globally operating neobank headquartered in London. With 18 million active customers (500k business users) worldwide, over 200 supported countries, and 30 different in-app currencies, it has become a colossus in the DB cosmos. By providing a user-friendly interface and innovative services such as smart budgeting, on-demand payments, bill-splitting, and stock, cryptocurrency, and commodity investments, Revolut’s goal is to transform how people manage and get more of their money (Revolut, 2022). After introducing open banking for German users, enabling them to connect their primary bank accounts (e.g., DB, Commerzbank, ING-DiBa) with the Revolut app (Bhattacharya, 2020), and the completion of a \$800 million Series E funding round, catapulting the company value to \$33 billion (Browne, 2021a), the British neobank has evolved into one of N26’s toughest competitors.

The first two neobanks have a more traditional and holistic business model in place, pursuing commercial goals such as increasing their customer base, providing the best services and CX, expanding to different geographies and ultimately boosting profitability. The following players, instead, also focus on sustainability, investing in climate change related projects, operating according to ESG-criteria, and substantially contributing to the achievement of the Sustainable Development Goals (SDGs). DKB is a so-called *direct bank* (i.e., neobank sub-category), as it also operates without a branch network, but through telecommunication (e.g., PC, fax, telephone) (Neuberger, 1997), while Tomorrow is a classic neobank.

DKB

Since its inception in 1990, DKB provides traditional banking services (e.g., credit cards, loans, savings, trading, and insurance) and embodies an anthropological funding approach, realizing social projects such as schools, hospitals, daycare centers, kindergartens, and nursing homes. In 2000, it built the first German internet-only bank without branches. Instead of aiming at short-term profit maximization, DKB's DNA is long-term oriented: since 1996, over €12 billion have been invested in 6.500 wind, solar and biogas plants, supplying energy to almost 6 million two-people households, making DKB the leading financier of the energy transition. Today, with almost 5.000 employees and 5 million customers nationwide, DKB is among Germany's leading virtual banks (DKB, 2022). Its philosophy combines sustainability with the power of technology: not only via its mobile app, but also through its digital platforms (e.g., DKB-crowd), the bank provides clients investment opportunities in various eco-friendly projects, striving to become a 100%-sustainable tech-bank (DKB, 2022).

Tomorrow

Built in 2018 and headquartered in Hamburg, Tomorrow is a social business with a vision to “use money as a lever for positive change” (Tomorrow, 2022). Guided by transparency, social equality, and the courage to think big, over 120 employees strive for impact and have already invested €87.5 million of customer deposits in societal and ecological future-proof projects related to renewable energies, rainforest preservation, and sustainable housing. Providing over 120.000 customers the 1st climate-neutral DB account worldwide and having the SDGs as cornerstone of its operations, the neobank showcases its achievements in the app and users can easily track their individual and the community's impact. This raises awareness about sustainability issues and drives users to positively contribute to the climate and society. Indeed, regardless of being smaller than its competitors, Tomorrow has proven to be a trustworthy organization not only due to its social and environmental engagement, but also because of its great corporate culture, shown by an employees' satisfaction rate of 95% (Tomorrow, 2020), and an excellent customer rating of 4.9/5 from over 10.000 App Store scores (Tomorrow, 2022).

These players show the pivotal role of banks in contributing to the achievement of the SDGs (Zimmermann, 2019). Additionally, existing literature describes how the concept of sustainable finance, defined as the “provision of financial capital and risk management products to projects that promote economic prosperity, environmental protection, and social justice” (Roy et al., 2015, p. 58), has gained more relevance in the industry. Multiple branchless banks also pursue

this philosophy, as highlighted above. Deegan (2002) and Deka (2015) portray DB as a green initiative of the entire sector, securing economic transactions and decreasing environmental hazards. Indeed, digital-only banking contributes significantly to promoting economic, social, and ecological sustainability (Dowling & Pfeiffer, 1975). Thus, neobanks need to undertake sustainability practices for enhancing their public reputation and increasing their value (Aziz & Naima, 2021). This might be crucial for gaining customers' trust, which is more difficult for banks without brick-and-mortar offices (Windasari et al., 2022).

3.2 Trustworthiness of Neobanks

In previous research, trust has been identified as the key component regarding the effectiveness of digital services, representing the touchpoint between individuals and technology (Hassan & Wood, 2020; Hengstler et al., 2016). Among those findings, it emerges that privacy and security are critical attributes of trust in MB (Malhotra et al., 2017; Sharma & Sharma, 2019). As people store personal information and data on their smartphones, they are concerned of hacker attacks or getting cheated (Ketelaar & Van Balen, 2018). Hence, banks and FinTechs must strengthen costumers' trust by delivering reliable technology (Shahid et al., 2022) and building highly secure platforms (Foroughi et al., 2019).

But what exactly is *trust*? Söderström (2009, p. 1) defined trust as the “willingness to believe in the reliability, honesty, dependability, and capability of others and, hence, also to be vulnerable to their actions”. The two main actors are the trustor (i.e., trusting party) and the trustee (i.e., trusted party). In DB, the trustor is the application's user, while the trustee would include the bank providing the service and the smartphone technology itself (Masrek et al., 2012). Thus, trust can be categorized according to two types of trustees: organization and technology (Söderström, 2009). The first one refers to relying upon a third party or institution to build trust (Gefen et al., 2003), while technology-based trust relates to a person's willingness to be vulnerable to a software's predictability, reliability, and utility (Lippert & Davis, 2006). Since trust is about the expectation management between two parties regarding specific actions and their underlying risks (McKnight & Chervany, 2001), it is often defined as a catalyst in shaping gratifying business relationships in the online world (Cao et al., 2018; Chen et al., 2019).

Given the greater perceived uncertainty and transaction complexity, trust is much more important in virtual settings (Amoako et al., 2019; McKnight & Chervany, 2002) such as MB

(Kaabachi et al., 2019). In previous studies, trustworthiness has been identified to largely impact customers' bank choices (Liang et al., 2009; Fathollahzadeh et al., 2011; Knutson et al., 2007; Akhter et al., 2011). In fact, it substantially influences neobank users' CX (Fathima, 2020), and its shortcoming is a major reason for potential customers not to adopt such a service (Lee & Chung, 2009; Kim et al., 2009). Besides privacy and security concerns, possible users face obstacles such as inadequate know-how, advent of competing brands, and synchronization between enabling entities (Sharma & Sharma, 2019).

Moreover, the absence of physical branches is associated with multiple issues (e.g., user authentication, confidentiality) and implies a higher risk for digital-only banks (Choudary, 2013) as customers might feel more hesitant to utilize the service. Therefore, building brand trust is of paramount importance for neobanks. For this purpose, it is fundamental to comprehend consumer preferences and individualize the elements that enhance digital-only banks' trust perception (Tosun, 2020). Furthermore, as pointed out by Windasari et al. (2022), competition in this area will become fiercer in the future. To obtain a competitive advantage, companies must acquire customers' attention on the usage of digital-only banking services. As neobanks' services are exclusively performed via mobile applications, it is worth elaborating on digital user experience (UX) and interface. However, publications about digital-only banks are scarce (Okunevych & Hlivecka, 2018).

This study intends to understand what kind of DB features are being implemented and how these impact neobanks' trustworthiness.

3.3 Target Market and Segment

In the early 2000s, OB already was a widely spread distribution channel across Europe. Exhibit 1 shows how adoption rates differed among various countries and displays a huge gap between Northern and Southern Europe as well as rich and poor parts of the population: Scandinavian countries registered rates between 60-80%, while many nations of continental Europe (e.g., Germany, Austria) had a ratio of only 40-50% (Deutsche Bank Research et al., 2005).

As described above, also the global neobanking market has experienced substantial growth in recent years and is expected to further expand in the future. This research entirely focuses on the German market, as DB customers highly value CX and neobank users are estimated to grow

at an incredible pace: in Germany, the 2.55 million customers of today will increase by over 100% in solely 5 years, surpassing the 5 million mark by 2027 (Statista, 2022).

Furthermore, this study aims to understand how people from different age groups prioritize DB features in relation to trust: The first one is 18-35, referring to younger individuals with higher digital-affinity (i.e., digital nomads) and different behaviors in using financial services (Windasari et al., 2022). Most neobank users are millennials who are familiar with using new technologies (Hopkinson & Klarova, 2019). The lower range end is only because the minimum age to open a bank account in Germany is 18 (Bundesregierung, 2016). The second group includes all people aged between 36-54, who have acquired some technological know-how, even though they are less likely to use DB services compared to younger generations (Harris et al., 2016). The last cluster targets older consumers aged 55 or more (Chaouali & Souiden, 2019; Moschis, 2003). Although they are generally more reluctant to use innovative platforms such as neobanks, as they manifest stress and anxiety when learning how to use modern-day technology (Chaouali & Souiden, 2019), the number of older customers has increased (Rajaobelina et al., 2020), also because of the COVID-19 pandemic (Tosun, 2020).

Trust plays a crucial role here, as older people are more loyal (Patterson, 2007) and have a higher WTP for brands that inspire trust (Swimberghe et al., 2018). Hence, if neobanks are interested in bolstering the proportion of older customers, they must implement strategies that enhance this ageing population's trust levels (Rajaobelina et al., 2020). Moreover, it might be significant, especially for managerial purposes, to also encompass the perspective of non-users. Neobanks have gained popularity not only among millennials, but also within the underbanked, due to their continuous effort to improving CX (Kline, 2015; Remolina, 2020). Literature also shows that studying trust focusing on potential customers is very important, particularly because they intend to engage with an unknown DB service provider. However, considering the lack of previous experience, possible adopters might perceive greater uncertainty when thinking to use a neobank for the first time. Former research found that, in general, non-users consider OB non-useful, showing low interest and enthusiasm in the topic and preferring face-to-face interactions at branches (Sarel & Marmorstein, 2003). Additionally, they might not have the know-how or familiarity with digital platforms, which results in a reduced social-technological and financial inclusion (Velazquez et al., 2022). Therefore, the establishment of trust is crucial to effectively convince potential clients to transact with neobanks (Kaabachi et al., 2017).

Notwithstanding, existing research on the linkage between neobanking features and trust is extremely limited. This study aims to fill this gap by uncovering empirical insights of users' and non-users' trust perception of neobanks, concentrating on the German market.

4. DB Features and CX-Trust Relationship

Mobile applications are software programs that run on smartphones (Zhao & Balagué, 2015), while apps' features refer to interactive elements that enhance the user interface and are developed for customer engagement (CE) purposes (Pleyers & Poncin, 2020; Zhao & Balagué, 2015). Neobanks provide feature-rich, customizable, and easily accessible applications (Finnovate, 2018), outperforming others' products and services (Kotler & Armstrong, 2010). Prior studies reveal that their appearance and features can increase CE and affect UX (Kim et al., 2013; Kumar et al., 2018). As the features appear immediately when services are delivered, a well-designed DB app further attracts users' attention and seizes their engagement (Islam et al., 2020; Wang et al., 2011).

In DB, CX refers to a "customer's interaction with technology" (Shahid et al., 2022, p. 3) and represents a very subjective phenomena (Fernandes & Pinto, 2019), which is triggered by human stimuli in response to specific point-of-contacts (Homburg et al., 2017) and keeps users engaged with a brand (Trivedi, 2019). Thus, aiming to retain current customers and attract new ones, banks must provide superior experiences that meet clients' expectations (Klaus & Maklan, 2013). For this purpose, trust plays a significant role, as it varies between existing and potential users (Lin, 2011; Mbama & Ezepue, 2018). It has been outlined as "willingness to rely on a partner (or firm) in whom one has confidence" (Moorman et al., 1992, p. 82) and helps reducing customers' anxieties related to insecurity and uncertainty (Mostafa, 2020; Shankar et al., 2020). According to Berraies et al. (2017), trust serves as centerpiece in building successful and long-lasting relationships between users and service providers, especially in risk-prone environments such as DB. Hence, to provide an excellent experience, neobank applications must be trustworthy (Shahid et al., 2022). Consequentially, CX is a crucial factor for DB adoption, as it strengthens customers' perceived trust and neobanks' trustworthiness (Jünger & Mietzner, 2019).

Bélanger and Carter (2008) claim that trust has been extensively analyzed in numerous studies. Nonetheless, research on trust and neobanks is very limited. This investigation's goal is to explore the relationship between DB features and neobanks' trustworthiness.

Instant Push Notifications

Compared to MB applications of traditional banks, neobank platforms offer sophisticated money-management tools with plenty functionalities (Hopkinson & Klarova, 2019). Features include the provision of real-time updates of critical banking transactions (e.g., cash withdrawal, payment finalization, bank transfer) (Boskov, 2019) and the reminder to pay borrowed money back (Windasari et al., 2022).

A push notification pops up on users' mobile devices as soon as an operation is completed (Boskov, 2019), delivering in-depth insights about their spending habits (Hopkinson & Klarova, 2019) and increasing their expense awareness. Shettar (2020) explains that most neobanks display the exact amount of available money on people's smartphones. N26, the prior-depicted German neobank, has implemented this feature (Finnovate, 2018), sending live notifications to clients and enhancing their CX by providing up-to-date account balances. This is possible through the effective usage of AI, which allows users not only to track expenditures, but also to swiftly detect and solve fraud cases. In these situations, neobanks send warnings to their customers via pop-up notice on their smartphone (Gorodianska et al., 2019).

This study's objective is to comprehend whether instant push notifications result in high or low trust levels among users and non-users towards neobanks.

Free Payments & Money Withdrawals Worldwide

Besides providing 100%-digital services and being very convenient, neobanks offer more financial and psychological benefits than traditional banks (Windasari et al., 2022). Two very convenient features are low-cost exchange rates and free ATM withdrawals worldwide. The first one refers to highly cost-effective transactions overseas, allowing customers to avoid paying foreign exchange fees on international payments (Hopkinson & Klarova, 2019). While they might need to make an official request for cross-border payments when using traditional debit cards, neobank users do not face similar restrictions (Temelkov, 2022). An example is Revolut, whose customers can spend in over 90 currencies at the best exchange rate available with no additional fees (Finnovate, 2018).

With the second feature, even though varying for different banking units (Shabu & Ramankutty, 2022), users benefit from free money withdrawals globally (Windasari et al., 2022). They can make safe and free cash drawings from a worldwide network of ATMs (Finnovate, 2018),

which greatly enhances users' CX, especially for globetrotters. At DKB, customers who have the so-called "*active-customer-status*", benefit from this feature (DKB, n.d.).

This research aims to assess whether free withdrawals and international payments lead to high or low trustworthiness of neobanks.

Spending Analysis

Compared to traditional banks, which are more product-driven, neobanks have the customer at the core. Via state-of-the-art technology, they want to exploit data to better understand people's needs and adapt existing (or define new) products and services (Temelkov, 2020). Thus, digital-only banks focus on providing holistic and customizable experiences with a more interactive and intuitive overview of users' financial habits (Lipton et al., 2016).

Among the non-purely financial products offered by neobanks, there are expense management tools, where users can check their spendings and filter them by month and retailer (Shettar, 2020). Furthermore, they comprise the categorization of expenses for different purposes (e.g., transportation, insurance, groceries, bars and restaurants, shopping, sports), helping customers to effectively regulate and monitor expenditures. This feature not only enhances CX due to its personalized content, but helps people to better budget their income for their day-to-day life (Shabu & Ramankutty, 2022).

This paper strives to understand whether expense management and analytics result in high or low trust perception between users and non-users of neobanks.

Immediate Money Transfer

As previously highlighted, neobanks also offer similar services as their traditional counterparts, but with the key advantage of speed and instantaneity. While at brick-and-mortar banks adding a new beneficiary account for transferring funds can take up to 3 business days due to multiple verifications, the same thing can be done in a couple of clicks via neobank applications. Another common functionality regards immediate money transfers between parties of the same neobank, enabling customers to conclude transactions within seconds, literally as soon as they press the "*Submit/OK*" button on the payment terminal. Normally, bank transfers take between 24-48 hours to arrive on the recipient's account but, with neobanks, users immediately receive a

notification with their up-to-date account balance (Shettar, 2020) and enjoy a feeling of comfort and enhanced CX.

N26 offers such a service, called “*MoneyBeam*”, allowing peer-to-peer payments of maximum €1.000 per transaction and €5.000 every 24 hours (N26, n.d.). Also businesses can exploit this feature for larger transfers, and in case of emergency they can be easily revoked inside the app (Shabu & Ramankutty, 2022).

This research intends to understand whether this feature leads to high or low trust levels of neobank users and non-users in Germany.

Customer Service 24/7

Until recently, exclusively online delivered services were viewed as a careless experience as consumers were obligated to serve themselves, whereas in offline settings the encounter with employees occurred daily (McLean & Wilson, 2016). However, there has been a drastic shift and today companies focus on providing the best CX (Shahid & Paul, 2021; Shank, 2013).

Advancements in technology led to the creation of online help desks, live-chat, and human service advisors to meet consumers’ needs (Turel & Connelly, 2013). Nowadays, digital-only banks also provide non-monetary benefits such as virtual customer services (Windasari et al., 2022). Through AI-powered chatbots (i.e., virtual agents), which are available 24 hours seven days a week, neobanks positively impact CX, resolving clients’ queries in real-time (Trivedi, 2019) and offering support in users’ natural language (El-Gohary et al., 2021). Menon (2018) shows that chatbots can handle over 1.5-2 million enquiries daily. Their incredible abilities to streamline and solve customer-facing interactions not only improve UX, but also release call-center agents to concentrate on value-adding activities (Sanmath, 2018).

Although past research demonstrates that customer support positively affects CX in DB (Mbama & Ezepue, 2018), literature linking this feature to neobanks’ trustworthiness is limited. This study intends to understand if 24/7 available customer service, both via chatbot and human in-app contact, leads to high or low trust towards neobanks.

5. Summary

After outlining the advent of neobanks and their gradually dominant role in the MB landscape, the literature review (LR) highlights the importance of customers' experiences, the widely-spread usage among differently aged individuals, and gaining users' and non-users' trust.

A new section referenced the strategic implementation of DB features by neobanks, which are intended to provide users an excellent CX and a practical app for all their banking activities. The review continued by delineating the linkage between CX and trust within neobanks, and its significance in building long-term and successful relationships between users and digital service providers.

In this research, the HP development is built upon the so-called *mediation effect analysis*. According to Baron and Kenny (1986), the mediator refers to a third variable that explains the relationship between the dependent and independent variables. In this paper, CX is characterized as a potential mediator of DB features' impact on people's trust perception of neobanks (Exhibit 4). However, the LR extensively depicts both the relationship between DB features and CX as well as the connection among CX and trust. Thus, this framework is merely used as a representation for HP-deduction purposes.

The goal of this study is to understand whether DB features result in high or low trust towards neobanks, and whether trust levels differ among users and non-users and between people from various age groups. As a result of what has been found in existing literature, the hypotheses of this research are presented:

HP 1: The “*Instant Push Notifications*” feature leads to high trust levels among users and non-users towards neobanks.

HP 1A: Non-users' trust levels are significantly lower than those from users.

HP 2: The “*Free Payments and Money Withdrawals Worldwide*” feature results in high trust levels among users and non-users towards neobanks.

HP 2A: Non-users' trust levels are significantly lower than those from users.

HP 3: The “*Spending Analysis*” feature leads to high trust levels among users and non-users towards neobanks.

HP 3A: Non-users' trust levels are significantly lower than those from users.

HP 4: The “*Immediate Money Sending*” feature results in high trust levels among users and non-users towards neobanks.

HP 4A: Non-users' trust levels are significantly lower than those from users.

HP 5: The “*Customer Service 24/7*” feature leads to high trust levels among users and non-users towards neobanks.

HP 5A: Non-users' trust levels are significantly lower than those from users.

Furthermore, by comparing unequal levels of digital affinity, this research's objective is to understand the impact of DB features on neobanks' trustworthiness among people from different age groups. Therefore, the following hypothesis is outlined:

HP 6: If the differences of trust levels between people from Age Group 1 (18-35 years old) and Age Groups 2 and/or 3 (respectively 36-54 and 55+ years old) are statistically significant, younger individuals show higher trust towards neobanks than older people.

III. METHODOLOGY

1. Research Method

In this research, a sequential mixed-method approach (Creswell, 2009) was applied, first using semi-structured interviews for the qualitative and afterwards an empirical survey for the quantitative section. Through open discussions with various participants, the goal was to explore customers' experiences, key existing and potentially appealing DB features, and if these impact their trust perception of neobanks. This was followed by a quantitative analysis via a questionnaire to test all the defined HPs and understand the results' significance level in relation to DB users' and non-users' trust towards neobanks.

2. Qualitative Section

2.1 Participants

In total, eight people from different age groups participated in open discussions and the distribution was equal between users and non-users of neobanks. The first group was selected based on participants' experience in using neobanks (i.e., having at least one active neobank

account and use it), while the second one was chosen considering contributors' unfamiliarity with digital-only banks (i.e., possessing a smartphone without any neobank application). Furthermore, the proportion between male and female respondents was balanced in both categories to avoid gender bias.

2.2 Outcome Summary

The primary objective of the qualitative exploratory research was to pre-validate the HPs delineated beforehand and potentially add new ones. In this context, such an approach is necessary because existing literature of DB features is limited. In addition, as neobanks operate in a fully virtual way, this research differs from other studies on digital services provided by traditional banks (Windasari et al., 2022). Furthermore, considering the purpose of the analysis, the intention was to include additional DB features (deemed important by the participants) in the final survey, and consequentially adjust the initially posed RQs.

The discussions were conducted in an open and friendly manner and had a conversational style. All questions were asked spontaneously to guarantee a free and unbiased idea-flow, without manipulating participants' statements. This approach was adopted to obtain participants' insights on what they value in neobanking experiences. Initially, they were asked to share their perspective on the DB features of the previous chapter, emphasizing their importance related to CX and whether their trust levels would be influenced. Both users and non-users deemed all elements relevant for increasing neobanks' trustworthiness, due to multiple reasons: detection of fraudulent activities, provision of better understanding and transparency of spendings, cash availability in different currencies, real-time transactions and emergency support.

Furthermore, the subject of sustainability emerged as an important topic in the banking context. Given banks' vital role in achieving the SDGs (Louche et al., 2019; Shrivastava et al., 2019; Busch et al., 2016) and their substantial impact on society and the environment (Zimmermann, 2019), interviewees were asked to brainstorm what kind of innovative DB features should be implemented to pursue two missions simultaneously: increase users' trust and positively contribute to the environment. The most interesting and feasible thoughts that were raised concerned sustainability projects that neobanks can invest in (e.g., see Tomorrow), increment people's awareness for CO₂-emissions, and knowing the direct societal impact to the SDGs. Neobanks could tackle each matter by providing users the following in-app functionalities: possibility of partial deposit allocation to preferred sustainability projects (Exhibit 3), CO₂-

footprint measurement, illustrating people's index compared to a regional benchmark and suggesting more environmentally-friendly products and services, and investments' impact measurement on SDGs, both from individual users and the entire community. These features would not only improve CX as users' preferences are considered (Mbama & Ezepue, 2018), but also provide neobanks valuable insights on how to tackle the SDGs (Zimmermann, 2019).

Therefore, the sustainability-related DB features were implemented into the survey, and a further statistical analysis was performed to assess their influence on users' and non-users' trust perception of neobanks. As a result, a RQ and HPs were added to the research:

RQ 2: Do sustainability-related DB features lead to high or low trust among users and non-users of neobanks?

HP 7: The “*Savings Allocation to Preferred Sustainability Projects*” feature results in high trust levels among users and non-users towards neobanks.

HP 7A: Non-users' trust levels are significantly lower than those from users.

HP 8: The “*CO₂-Footprint Tracking*” feature leads to high trust levels among users and non-users towards neobanks.

HP 8A: Non-users' trust levels are significantly lower than those from users.

HP 9: The “*Impact Measurement of SDGs Contribution*” feature results in high trust levels among users and non-users towards neobanks.

HP 9A: Non-users' trust levels are significantly lower than those from users.

The insights drawn from the open discussions, coupled with an exhaustive literature review, facilitated the formulation of the online questionnaire for the quantitative analysis.

3. Quantitative Section

3.1 Pilot Study

Before carrying out the main test, a pilot study was conducted to ensure there was no ambiguity in the analyzed DB features, assess the research design's structure and feasibility, and evaluate the time required for completion. Via an online survey, respondents were asked to provide a score from 1 (strongly disagree) to 5 (strongly agree) for every feature, based on the following

criteria: trustworthiness of and trust feeling towards a neobank. As illustrated in Exhibit 2, the list comprised 5 traditional and 3 sustainability-related features. Both categories were analyzed independently, and all respondents were explicitly asked to assess each feature individually. In total, 10 responses were submitted, and average scores were computed for users, non-users, and the totality of each feature. This procedure served as a backbone to the qualitative section, and participants' feedback was considered to make necessary changes in the primary analysis. All respondents were excluded from the main study.

3.2 Main Study

To achieve the objectives of the RQs, primary data was collected upon a first consideration of the secondary information provided in the LR. An experimental study was performed through the distribution of an online survey. This method facilitates the access to individuals in distant locations and allows automated data collection, reducing time and effort of the researcher (Wright, 2005).

The survey was administered in English language and translated into German as the study's geographical scope is the German market. The questionnaire was built using Qualtrics Survey Software, which allows for rapid data collection and various functions including the termination of the survey if participants are inadequate for the study (i.e., not residing in Germany) and immediate conversion of data into SPSS format. A link generated by Qualtrics directly rerouted respondents to the survey. The link was distributed both via direct messages (WhatsApp, SMS) and social media platforms (Instagram, LinkedIn).

3.2.1 Sampling

In this study, the convenience-sampling method was adopted given its low time-intensity, affordability, convenience, and accessibility. Unlike population-based sampling mechanisms, this strategy is a non-probability sampling method based on randomization and proximity to the research (Bornstein et al., 2013).

3.2.2 Research Participants

A total of 151 participants responded to the survey, all of which were volunteers. Data screening was done to check for any incomplete and unengaged responses. Out of 151 questionnaires, 27 were found to be insufficient and therefore eliminated, resulting in a sample size of 124 valid responses for the final study.

3.2.3 Research Materials

In this study, the dependent variable is *trust*, which was analyzed through a series of questions related to the following independent variables: *Instant Push Notifications*, *Free Payments and Money Withdrawals*, *Spending Analysis*, *Immediate Money Transfer*, *Customer Service 24/7*, *Savings Allocation to Preferred Sustainability Projects*, *CO₂-Footprint Tracking*, and *Impact Measurement of UN SDGs Contribution*. All questions were assessed based on a 5-point Likert Scale, with anchors ranging from 1 (strongly disagree) to 5 (strongly agree).

3.2.4 Research Procedure

In total, the survey layout comprised the following sections (Exhibit 5): consent form, assessment of market feasibility, introduction, traditional and sustainability-related DB features, and socio-demographic characteristics. Initially, participants were shown a consent form to assure absolute confidentiality and anonymity in data collection and handling. Together with the expected duration of completing the survey, respondents were also reminded that there were no right or wrong answers.

After giving their assent by moving forward, a question that verified or denied people's feasibility for the study was shown. As Germany is the target market, only respondents that permanently reside there were considered for the sample and had the opportunity to complete the survey. An exception was made for participants who temporarily (up to 2 years) live abroad, for example due to seasonal work placements or academic exchange semesters overseas, but are surely coming back to Germany.

Subsequently, the main study took place and participants were asked to indicate the following information: firstly, whether they are users or non-users of neobanks, and secondly their trust levels for all traditional and sustainability-related DB features. Each feature was briefly described to guarantee a proper understanding of how it works, also for those who might already be familiar with neobanks but do not know every attribute.

The last section required participants to provide socio-demographic information (gender, age, occupation). Finally, a "Thank You" message was displayed confirming that their responses have been successfully registered.

IV. ANALYSIS OF RESULTS

1. Sample Characterization

The sample of the main study comprised a total of 124 participants with more than half being users of neobanks (57%). A large proportion (62%) was male, while 37% was female and only 1 respondent preferred not to disclose their gender. Approximately 81% are aged between 18 and 35, while 14% and 5% belong to the range of 36-54 and 55+ years respectively. Among the first age group, 65% were users and 35% non-users of neobanks, whereas of the 36-54 cluster, 24% indicated to be users and 76% non-users. Thirdly, within the 55+ range, 29% were users and 71% non-users of neobanks. Lastly, most respondents were employed (60%), while the remaining ones indicated their current occupation as students (28%), working students (8%), retired (1%), unemployed (1%), or other (2%). Exhibit 6 depicts the socio-demographic characteristics of the sample.

2. Data Reliability

For each feature-related question in the survey, the consistency of the multi-item scales was measured using the Cronbach Alpha test to ensure their reliability (Tavakol & Dennick, 2011).

Table 1: DB Features – Multi-item Scales Analysis

DB Features	Number of Items	Cronbach's Alpha
Instant Push Notifications	2	$\alpha = .763$
Free Payments & Money Withdrawals	2	$\alpha = .757$
Spending Analysis	2	$\alpha = .853$
Immediate Money Transfer	2	$\alpha = .863$
Customer Service 24/7	2	$\alpha = .927$
Savings Allocation to Sustainability Projects	2	$\alpha = .893$
CO ₂ -Footprint Tracking	2	$\alpha = .861$
Impact Measurement of SDGs Contribution	2	$\alpha = .938$

Source: Own illustration. Information retrieved from Cronbach Alpha Test in SPSS.

Since Cronbach's Alpha value, for each DB feature, was above 0.7, the analysis reflects a high level of internal consistency for all assessed items (Barbera et al., 2020). It is crucial to

determine coherence before performing a test for research purposes to guarantee validity (Tavakol & Dennick, 2011). Given the high consistency scores, 8 new composite variables were created to evaluate participants' trust levels by computing the mean score of the 2 items (i.e., “*this neobank is trustworthy*”; “*this feature increases my trust level*”) for each DB feature.

3. In-depth Analysis

3.1 Mechanisms

The in-depth analysis consisted of descriptive statistics to verify the existence of high (or low) trust among users and non-users of neobanks. The examination was further decomposed by using independent samples t-tests to understand the difference of trust perception between the two sub-groups. Lastly, by computing One-Way ANOVA tests, the goal was to determine whether trust levels significantly differed among people belonging to various age groups.

3.2 Descriptive Statistics

The objective of this analysis was to understand if DB features lead to high or low levels of trust among users and non-users of neobanks. For this purpose, the descriptive statistics of each composite variable have been assessed. To characterize the data, the mean of each feature can be used. However, mean scores often represent a limited value, unless the data follow a classic normal distribution (Sullivan & Artino, 2013). To prove that, it is necessary to run statistical tests of normality through SPSS, which yield the significance values.

Table 2: Sample Data – Normal Distribution Check

Variables	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
DB Feature 1	.164	124	< .001	.913	124	< .001
DB Feature 2	.169	124	< .001	.911	124	< .001
DB Feature 3	.165	124	< .001	.902	124	< .001
DB Feature 4	.207	124	< .001	.871	124	< .001
DB Feature 5	.260	124	< .001	.796	124	< .001
DB Feature 6	.181	124	< .001	.901	124	< .001
DB Feature 7	.192	124	< .001	.916	124	< .001
DB Feature 8	.187	124	< .001	.896	124	< .001

Source: Own illustration. Statistical data retrieved from SPSS.

Table 2 presents the results of the Kolmogorov-Smirnov as well as the Shapiro-Wilk test for each composite variable. Since all significance values, of both tests and for each DB feature, are below $\alpha = 5\%$, the data deviate from a normal distribution. Thus, it is not very effective to use the mean as an indicator of central tendency, especially because it is very susceptible to the presence of outliers. This often results in skewed mean scores, which are not the best representation of the central location of the data. For this purpose, it is more adequate to examine the median of each variable.

The median is the middle score of a dataset that has been arranged in ascending order and is less impacted by outliers and skewed figures. It splits a dataset into two equally sized groups. Furthermore, as in ordinal datasets (e.g., 5-point Likert Scale) responses are being rated or ranked, their distance is not measurable (i.e., “*strongly agree*” is not twice as much as “*agree*”). Hence, it is not possible to assume that differences between responses are equidistant even though the numbers assigned to those answers are (Sullivan & Artino, 2013). Therefore, the median is a more appropriate indicator, as it does not take the “*distance*” or “*weighting*” of answers into consideration (Koustoulas, 2014).

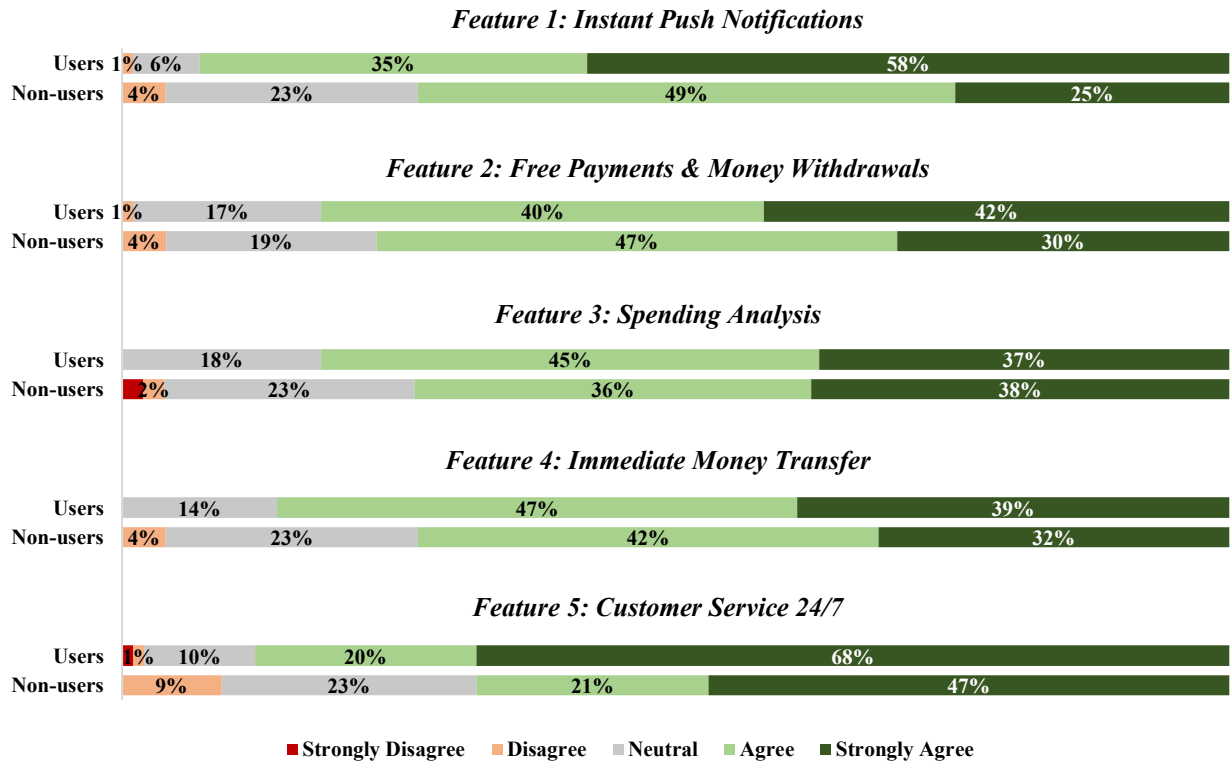
However, it is not recommended to use the median as sole indicator of preference. In fact, ordinal data may be characterized by using frequencies and/or percentages for each response section of each variable (i.e., DB features) (Jamieson, 2004), split between users and non-users. Thus, examining the combination between median scores and response frequencies is the most adequate procedure for this analysis.

Table 3: Traditional DB Features – Median Analyses (Users & Non-users)

# HP	N (Users)	N (Non- users)	Median (Users)	Median (Non-users)	Structural Relationship	Results
1	71	53	4.50	4.00	Feature 1 → Trust	Supported
2	71	53	4.00	4.00	Feature 2 → Trust	Supported
3	71	53	4.00	4.00	Feature 3 → Trust	Supported
4	71	53	4.00	4.00	Feature 4 → Trust	Supported
5	71	53	5.00	4.00	Feature 5 → Trust	Supported

Source: Own illustration. Statistical data retrieved from SPSS.

Chart 1: Traditional DB Features – Response Frequencies



Source: Own illustration. Statistical data retrieved from SPSS.

Table 3 illustrates that the median scores of users and non-users of neobanks are equal for DB features 2, 3, and 4 ($Mdn = 4$). For features 1 and 5, the medians are even higher for users, displaying values of $Mdn = 4.50$ and $Mdn = 5.00$ respectively. Moreover, Chart 1 exhibits the response frequencies for each feature and section, divided by users and non-users. It shows that most respondents indicated agreement with the idea that traditional DB features lead to high trust levels towards neobanks, supporting HPs 1-5. However, each functionality, besides feature 3, expresses stronger agreement within users than non-users, especially highlighted in feature 5 ($N = 48$, 68%).

Author's Use Case – Feature 5: Customer Service 24/7

The author received two emails on two different days from a leading German neobank and was asked to reset his user password. After getting suspicious, he verified with the bank that it was a hackers' phishing attempt and immediately contacted the customer service via the in-app chatbot to solve the issue. Unfortunately, the chatbot was unable to understand the problem and the author requested to talk to an employee from the customer service department. The

conversation occurred on a Friday at 10:30 pm, closely before shift ending (11 pm). After clarifying the situation, the author was told to provide a second valid email address to log into the application. Then, he needed to leave the platform, de-install, and re-download the application. Meanwhile, a link was sent to the provided email address to reset his password. This way, potential hackers would need to re-identify both username and password. Eventually, it was possible to enter the app with the new credentials. The entire procedure took less than 15 minutes. Overall, the CX was fantastic: quick, simple, and effective. Additionally, it drastically increased the author's trust towards the neobank, in conformity with the analysis' results.

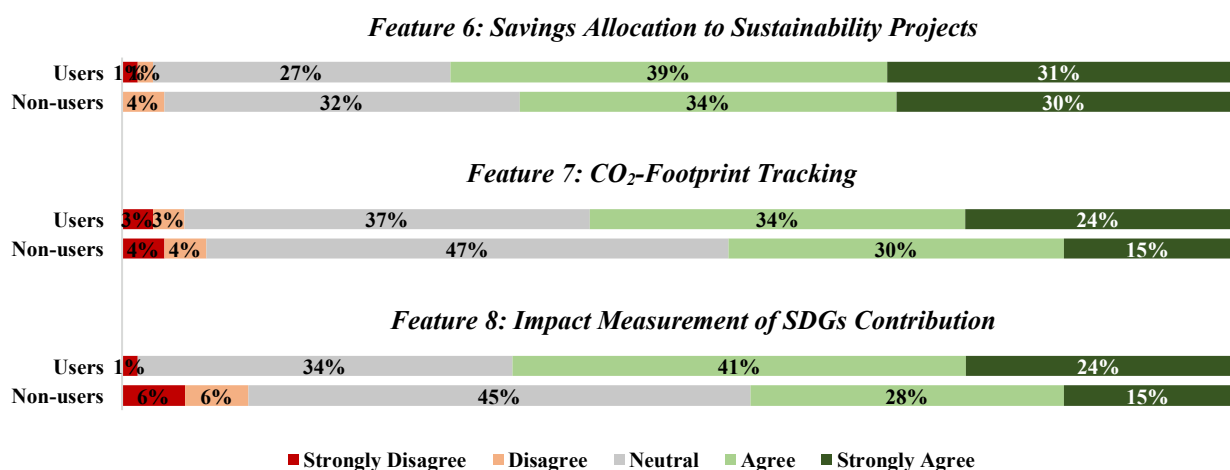
Similarly to the traditional functionalities, the goal of this research was to also comprehend whether sustainability-related DB features lead to high or low trust between users and non-users of neobanks. The procedure was equal as above and both median scores and response frequencies were calculated for both sub-groups in relation to each feature.

Table 4: Sustainability-related DB Features – Median Analyses (Users & Non-users)

# HP	N (Users)	N (Non- users)	Median (Users)	Median (Non-users)	Structural Relationship	Results
7	71	53	4.00	4.00	Feature 6 → Trust	Supported
8	71	53	3.50	3.00	Feature 7 → Trust	Yes/No
9	71	53	4.00	3.00	Feature 8 → Trust	Yes/No

Source: Own illustration. Statistical data retrieved from SPSS.

Chart 2: Sustainability-related DB Features – Response Frequencies



Source: Own illustration. Statistical data retrieved from SPSS.

Table 4 presents the median scores for all sustainability-related DB features, pointing out that solely for feature 6 the values are equally high for users and non-users of neobanks ($Mdn = 4$). Features 7 and 8, conversely, showcase larger differences among medians for both sub-groups, particularly within feature 8 ($MdnU = 4$; $MdnNU = 3$). Additionally, Chart 2 exemplifies response frequencies for each functionality and section, split by users and non-users. It reflects that most users agree that sustainability-related DB features lead to high trust levels towards neobanks, supporting HPs 7 fully and HPs 8-9 only partially as the non-users sub-group expressed to have a more neutral standpoint ($N = 25$, 47%) and ($N = 24$, 45%) respectively.

3.3 Independent Samples T-tests

Usually, multiple parametric statistical tests (e.g., t-tests, Pearson correlations) require data to be normally distributed. However, Dr. Geoff Norman, a world-leading scholar in medical education research methodology, has extensively reviewed this controversy, proving through various examples, using real and simulated data, that parametric tests can also be used with ordinal data (e.g., Likert Scales) and that in general they are more robust than non-parametric tests. Indeed, parametric tests tend to provide the most accurate responses even though statistical assumptions (e.g., normal distribution of data) might be violated (Norman, 2010).

Traditional DB Features

The first set of independent samples t-tests comprised the analysis of traditional DB features (i.e., feature 1-5) as dependent variables. The purpose was to comprehend whether there is a statistically significant difference among respondents' ID (i.e., users vs. non-users), which functioned as independent variable in each test, regarding trust perception towards neobanks.

Table 5: Traditional DB Features – Independent Samples T-test Results

Variables			Significance	Mean Difference	95% C. I.	
	t	df	Two-sided p		Lower	Upper
DB Feature 1	3.971	122	< .001	.510	.256	.765
DB Feature 2	1.149	122	.253	.165	-.119	.449
DB Feature 3	.661	96	.510	.096	-.193	.386
DB Feature 4	1.915	122	.058	.268	-.009	.545
DB Feature 5	2.461	99	.016	.427	.083	.772

Source: Own illustration. Statistical data retrieved from SPSS.

In this analysis, the adopted significance level was $\alpha = 5\%$. The figures in table 5 are presented according to Levene's test output (Exhibit 7), which checks for equality of variances among the sub-groups. While the p-values are large for DB feature 1 ($p = .314$), DB feature 2 ($p = .965$), and DB feature 4 ($p = .194$), implying to rely on the first row of output of Levene's test (i.e., "*Equal variances assumed*"), they are small for DB feature 3 ($p = .036$) and DB feature 5 ($p = .028$), meaning that it is possible to reject the null HP and rely on the test's second row (i.e., "*Equal variances not assumed*"). This is important for looking at the correct results of the actual independent sample t-tests and the corresponding confidence interval.

The t-tests' results (Table 5 & Exhibit 8) show that there is a statistically significant mean difference among users and non-users of neobanks for the following traditional functions: DB feature 1 ($M_{users} = 4.27$, $SD_{users} = .670$; $M_{non-users} = 3.76$, $SD_{non-users} = .757$; $t(122) = 3.971$, $p < .001$, $d = .71$) and DB feature 5 ($M_{users} = 4.41$, $SD_{users} = .851$; $M_{non-users} = 3.98$, $SD_{non-users} = 1.028$; $t(99) = 2.461$, $p = .016$, $d = .93$). For DB feature 4, instead, a marginal significance was detected ($t(122) = 1.915$, $p = .058$, $d = .77$).

Moreover, as statistical significance is a function of a sample's dimension, implying that it becomes larger with an increasing sample, it is important to report the actual magnitude of the effects in a standardized manner. This is relevant to communicate the practical significance of results (Lakens, 2013). The effect sizes for this analysis ($d = .71$), ($d = .77$) and ($d = .93$) were found to exceed Cohen's (1988) benchmarks for medium ($d = .50$) and large effects ($d = .80$) respectively.

Results suggest that DB features 1 and 5 lead to lower trust levels among non-users of neobanks, with medium and large practical implications, fully supporting HP 1A and HP 5A. DB feature 4 shows marginal significance, partially supporting HP 4A. Additionally, outcomes indicate similar trust levels among the two sub-groups for DB feature 2 ($t(122) = 1.149$, $p = .253$, $d = .79$) and DB feature 3 ($t(96) = .661$, $p = .510$, $d = .78$), not supporting HP 2A and HP 3A.

Sustainability-related DB Features

Alongside the previous analysis, the objective of this study was to understand whether there are statistically significant differences in trust levels among users and non-users (i.e., ID as independent variable) of neobanks when it comes to sustainability-related DB functions (i.e., dependent variables).

Table 6: Sustainability DB Features – Independent Samples T-test Results

			Significance		95% C. I.	
Variables	t	df	Two-sided p	Mean Difference	Lower	Upper
DB Feature 6	.387	122	.700	.060	-.245	.364
DB Feature 7	1.347	122	.181	.219	-.103	.541
DB Feature 8	2.570	122	.011	.416	.096	.737

Source: Own illustration. Statistical data retrieved from SPSS.

As in the former analysis, the significance level was $\alpha = 5\%$. Again, the results in table 6 are exhibited according to Levene's test output (Exhibit 9). In this case, p-values were high for features 6 ($p = .597$), 7 ($p = .849$), and 8 ($p = .206$), implying to not reject the null HPs and take into consideration the results of the "*Equal variances assumed*" rows.

Regarding sustainability-related DB features, the t-tests' results (Table 6 & Exhibit 10) show that there is a statistically significant mean difference among users and non-users of neobanks only for DB feature 8 ($M_{users} = 3.77$, $SD_{users} = .805$; $M_{non-users} = 3.36$, $SD_{non-users} = .997$; $t(122) = 2.570$, $p = .011$, $d = .89$). For this analysis, the effect size ($d = .89$) exceeds Cohen's convention of a large effect ($d = .80$).

Results indicate that DB feature 8 leads to lower trust levels among non-users of neobanks and displays huge practical significance in the real world, fully supporting HP 9A. Furthermore, outcomes showcase no statistically significant difference among the two sub-groups in relation to DB feature 6 ($t(122) = .387$, $p = .700$, $d = .85$) and DB feature 7 ($t(122) = 1.347$, $p = .181$, $d = .90$), not supporting HP 7A and HP 8A.

3.4 One-Way ANOVA Tests

Throughout the third analysis, the objective was to understand whether trust levels significantly differed among people belonging to different age groups. Since participants were divided into three age groups (Age Group 1: 18-35 years old; Age Group 2: 36-54 years old; Age Group 3: 55+ years old), the independent samples t-test was inappropriate as it can compare the means of only two groups. Therefore, to verify the existence of main effects of the independent variable (i.e., *age*) on the dependent variables (i.e., *DB features*), one-way ANOVA tests were conducted at the 95% confidence level.

The ANOVA tests revealed that trust levels did not differ significantly among age groups for DB feature 1 ($F(2, 121) = .941, p > .05$), DB feature 2 ($F(2, 121) = .501, p > .05$), DB feature 4 ($F(2, 121) = 1.502, p > .05$), DB feature 6 ($F(2, 121) = .235, p > .05$), DB feature 7 ($F(2, 121) = 2.337, p > .05$), and DB feature 8 ($F(2, 121) = 2.454, p > .05$) (Exhibit 11). Due to their statistical insignificance, it was not necessary to analyze the multiple comparison table of the post-hoc tests.

However, the tests also detected a statistically significant difference between the age groups for DB feature 3 ($F(2, 121) = 3.798, p < .05$) and DB feature 5 ($F(2, 121) = 3.240, p < .05$) (Exhibit 11). Since Levene's test for homogeneity of variances (Exhibit 12) is not significant ($p\text{-value} > .05$), *equality for variances* was assumed. To check for individual differences among sub-groups, post-hoc comparisons were examined using Tukey's HSD test (Exhibit 13). The test indicated that the mean score for Age Group 1 ($M = 4.10, SD = .735$) was significantly different from Age Group 2 ($M = 3.62, SD = .820$) (Table 7) for DB feature 3 ($p = .044$). Regarding DB feature 5, instead, pairwise comparisons of the means did not reveal any statistically significant difference ($p\text{-value} > .05$) among sub-groups (Exhibit 13), except between Age Group 1 ($M = 4.33, SD = .902$) and Age Group 2 ($M = 3.76, SD = 1.002$), which results to be marginally significant ($p = .059$). Moreover, this analysis found that effect sizes for DB feature 3 ($d = .64$) and DB feature 5 ($d = .62$) exceed Cohen's reference for a medium effect ($d = .50$).

Table 7: One-Way ANOVA – Descriptive Statistics

Variables	Comparison	N	Mean	Std. Deviation	95% C. I.	
					Lower	Upper
DB Feature 3	18-35 years old	100	4.10	.735	3.95	4.25
	36-54 years old	17	3.62	.820	3.20	4.04
	55+ years old	7	3.64	.945	2.77	4.52
	Total	124	4.01	.776	3.87	4.15
DB Feature 5	18-35 years old	100	4.33	.902	4.15	4.51
	36-54 years old	17	3.76	1.002	3.25	4.28
	55+ years old	7	3.86	1.215	2.73	4.98
	Total	124	4.23	.951	4.06	4.39

Source: Own illustration. Statistical data retrieved from SPSS.

As a result, younger participants (i.e., Age Group 1: 18-35 years old) have higher trust levels towards neobanks than older ones (i.e., Age Group 2: 36-54 years old) in relation to *Spending Analysis* and *Customer Service*, both illustrating medium practical relevance levels in the real world. Thus, HP 6 is supported for DB feature 3 and partially confirmed for DB feature 5.

V. CONCLUSIONS AND FUTURE RESEARCH

1. Findings and Discussion

The main purpose of this study was to comprehend whether DB features lead to high or low trust levels among users and non-users of neobanks, and to discover and assess any significant differences in trust perception between sub-groups.

Trust Level Analysis: Users & Non-users

Consistent with the above-mentioned expectations, findings demonstrate that traditional DB features lead to high trust levels, both between users and non-users of neobanks. Capitalizing on conventional banks' weaknesses (e.g., strict regulations, increased competitiveness, slow digital transformation) (Temelkov, 2020), neobanks have continuously focused on providing customers convenient, flexible, and personalized products, combined with secure and cutting-edge technology. Instantly receiving push notifications on smartphones as soon as banking transactions are completed, monitoring categorized expenses, withdrawing money globally, and being able to contact the customer service directly from the app are true game-changers in the sector. This is not only translated into an enhanced CX for users, but also into high trust towards neobanks in Germany.

Moreover, although non-users are not very familiar with neobanks, they might have interacted with similar platforms (e.g., OB, SMS banking), gaining experiences with receiving *Banking Notifications* on mobile devices and contacting the *Customer Service* via hotline, and thus understand the intrinsic benefits of DB features, which reflect the positive trust results.

Likewise, considering RQ 2, sustainability-related DB features result in high trust perception, with a surprising exception that *CO₂-Footprint Tracking* and *Impact Measurement of SDGs Contribution* display only moderate levels within non-users. In recent years, sustainability has become more relevant in society and gained even more attention in the German banking industry (Zimmermann, 2019), especially after players such as *Tomorrow* have entered the

market. This explains the high trust levels for neobank users who, alongside traditional DB features, are also interested and value contributing to a better planet through their banking activities.

Contrarily, non-users seem slightly more skeptical towards sustainability within neobanks, displayed by the neutral trust levels for DB features 7 and 8. This is potentially related to the lack of interest in the topic and experience of usage. However, if the study's sample had more knowledge about sustainability and the presented functions, outcomes would possibly be higher, since literature highlights the increasing relevance of sustainability in branchless banking (Zahid et al., 2021) and new actors are establishing their position in the market.

Comparative Analysis: Users vs. Non-users

The findings of the comparison between users' and non-users' trust levels towards neobanks are coherent with HP 1A, HP 4A (marginally), and HP 5A. Although the previously-illustrated results disclose high trust levels also for non-users, there seems to be a significant gap between both sub-groups. *Instant Push Notifications*, *Immediate Money Transfer*, and *Customer Service* indicate lower trust among non-users, who seem to be more sensitive about privacy and sharing personal information through the neobank app, perceive greater uncertainty, and prefer solving queries at physical branches and maintain face-to-face interactions.

Furthermore, outcomes are congruent with HP 9A, pointing out that *Impact Measurement of SDGs Contribution* leads to lower trust amidst non-users. Again, this signals low familiarity with the topic and might symbolize general reluctance towards banks being engaged in sustainability practices, as they have been involved in huge greenwashing scandals lately (Clowes, 2022).

Comparative Analysis: Age Group 1 vs. Age Group 2 & Age Group 3

Concerning HP 6, findings suggest that merely for *Spending Analysis* and *Customer Service* there is a relevant difference in trust levels between 18-35 and 36-54 years old individuals. Age Group 1 showcases higher trust than Group 2, implying that older people are more doubtful and averse towards innovative services provided by neobanks. Their comparatively lower digital affinity and inexperience with using DB platforms raises questions regarding the reliability of data-driven insights, automatized chatbot services, and whether these add value to customers, which consequently results in lower trust levels.

However, looking at the other DB features, trust perception is similar among age groups, failing to fully support HP 6. This backs previous research that emphasized how older generations had to adapt their customs to global technological disruption (Rajaobelina et al., 2020) and to unexpected events such as the COVID-19 pandemic (Tosun, 2020). In fact, besides being more tech-savvy compared to a few years ago, older customers cannot be characterized as anxious about technology (Fregolente et al., 2019).

In general, this research provides a comprehensive understanding of the relationship between DB features of neobanks and individuals' trust perception. From an academic and managerial standpoint, several implications can be drawn, as discussed in the following paragraph.

2. Academic and Managerial Implications

Academic Implications

This research's objective was to provide further touchpoints to existing theory about the neobank cosmos. While previous studies focus on the comparison between customers of click-and-mortar and digital-only banks (Kaabachi et al., 2019), the present paper contributes to literature by exploring multiple DB features, combined with an assessment of trust perception between existing/potential users and multiple age groups, offering a holistic panorama of the neobank industry in Germany.

Findings show that, in relation to specific DB functions, there are significant disparities in trust perception among users and non-users of neobanks, and between people belonging to different age groups, partially confirming that potential adopters perceive greater uncertainty about using digital-only banks (Sarel & Marmorstein, 2003) and older people tend to be more anxious about innovation (Chaouali & Souiden, 2019).

Managerial Implications

The findings of this study provide important implications related to the DB features neobanks should incorporate in their product offering and how to effectively address the concerns and needs of underserved market segments.

Specifically, non-users' trust levels might be negatively impacted by ambiguous data-handling and security measures. Thus, neobanks are not only grappling with increasing competitiveness and innovation, but also with people becoming more cautious and receptive (Shahid et al.,

2022). Accordingly, digital-only banks should be more *transparent* about their regulations, the treatment of sensitive data, and how they operate, which probably is amongst the biggest question marks of the vast majority of the population.

Furthermore, in relation to specific DB features, outcomes reveal lower trust levels among non-users and older people. Compared to their counterparts, they may feel greater risks and uncertainty about neobanks' business models, especially when it comes to sustainability and perks of DB functions. Neobanks do not benefit from simply implementing sophisticated features in their apps and engaging in ESG-related practices. Therefore, they should focus on *educating* target segments both on how sustainability can be an integral part of a neobank's DNA and how the effective usage of DB features helps organizing personal finances. This goes hand-in-hand with *raising awareness* about neobanks constituting a new market in the sector, by providing workshops and tutorials, set-up advertisements and social media campaigns, and speak at events, all directed at acquiring the trust of unbanked and skeptical individuals.

Moreover, findings suggest that, in fact, DB features lead to high trust levels among customers of neobanks. This does not only offer industry professionals useful information about which functions are worth deploying and invest in, but also helps them identify which products and services are perceived as an additional value for consumers. Hence, the main takeaways are that neobanks are able to gain precious data about users and develop effective strategies to provide them with personalized and attractive services, retain existing customers due to constantly high trust levels, and ultimately obtain a long-term competitive advantage towards traditional players.

However, neobanks should not dedicate all resources to the design and development of DB features in order to attain or increase people's trust, but strive to find complementary elements such as information design, visual appeal (Kaabachi et al., 2019), and customer engagement.

3. Limitations and Future Research

In spite of providing relevant insights about neobanks' trustworthiness in the German market, this research study has some limitations that can provide stimuli for further investigations in this area.

The first limitation is related to the restricted sample size and the predominance of participants aged between 18 and 35, which compromises the results of HP 6. Data was collected and tested from all age groups, but the sample's age distribution is younger than the one of entire Germany (Statistisches Bundesamt, 2022). Moreover, the convenience-sampling method adopted in this study has two main drawbacks: produced outcomes lack generalizability due to the bias of the sample and it does not account for socio-demographic variation, leading to insufficient power to identify significant discrepancies among sub-groups (Bornstein et al., 2013). Hereupon, future research should include a more powerful and robust sample size as well as a more even distribution among people belonging to different age groups to avoid limited representability.

Secondly, employing online questionnaires as research instrument inherently presents a few restrictions: unequal access to the internet and thus to the survey, limiting the study's sample size (Ilieva, 2002). This is also related to using social media platforms and phone messages as primary distribution channel. Additionally, as surveys are self-administered by nature, people might misinterpret answering instructions, leading to dishonest outcomes and respondents not terminating the questionnaire (Evans & Mathur, 2005).

Thirdly, the geographical scope of this research is on users and non-users of neobanks in a developed country. Future researchers can investigate whether the results of this paper can be generalized to similar nations and/or differ from less developed ones. The comparison between developed and developing countries can also provide relevant outcomes, especially linked to cultural disparities. In fact, it might be interesting to assess whether results diverge between people with different nationalities.

The fourth limitation regards the in-depth analysis of this study and more specifically refers to how trust has been measured. After narrowing down the multi-item scales, merely one element was considered for evaluation purposes. In order to provide a more complete and robust picture of the various dimensions of trust, future research should focus on incorporating multiple items in their analyses (e.g., *"this neobank app is trustworthy"*; *"this neobank app is secure"*; *"I feel*

safe providing my personal data into the neobank app”). This could lead to even more authentic and meaningful results in this relatively unexplored research area.

In light of the previous limitation, it is important to emphasize that, due to time constraints, this study exclusively spotlights participants’ trust level in absolute terms at first and afterwards in a comparative manner by analyzing differences among sub-groups. However, as demographic factors play a substantial role in adoption decisions (Crabbe, 2009), it might be relevant to examine how trust impacts usage levels of neobanks and whether there is a difference between several groups of respondents (e.g., users vs. non-users; Europe vs. Asia; high income vs. low income).

Lastly, although having gathered information from existing literature about how DB features work, the potential lack of clarity in the survey questions and insufficient evidence of sustainability-related functionalities may have compromised respondents’ answers. Especially non-users of neobanks might have faced difficulties of comprehension due to missing know-how and experience of usage. Prospective researchers should check whether participants have understood the provided information (e.g., via a “*the description of the DB feature was clear*” check-box). Moreover, future investigations could compare both feature categories and define a set of DB functions that should be included in effective go-to-market strategies of upcoming players in the neobank sector.

VI. APPENDICES

Exhibit 1: Online-banking Adoption Rates in Europe (2005)

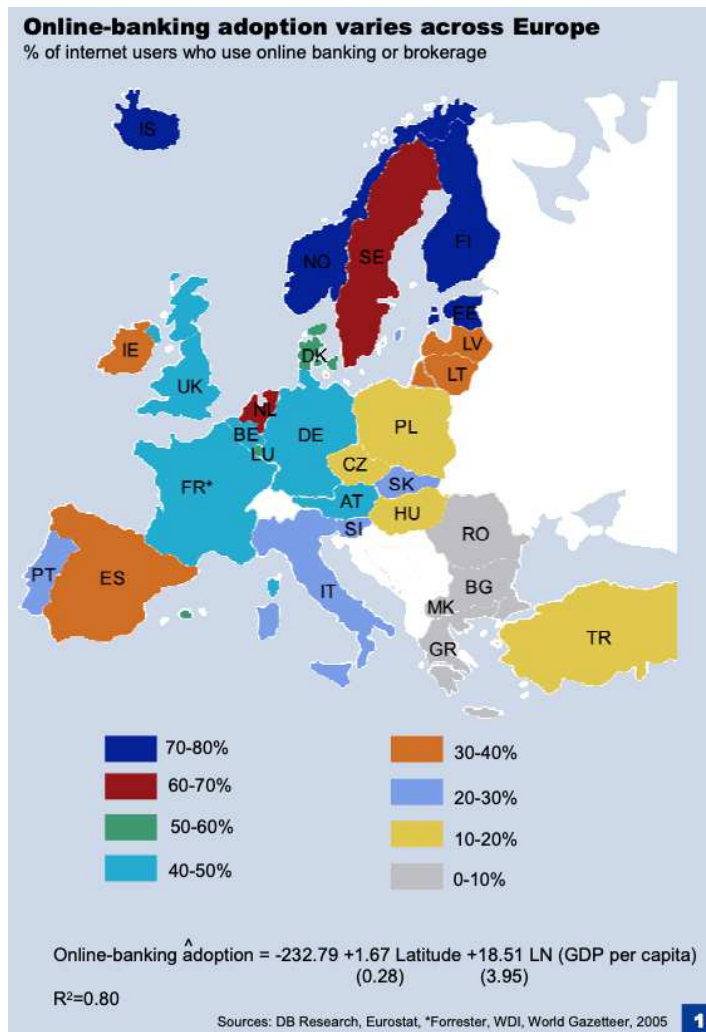


Exhibit 2: Results of Pilot Study

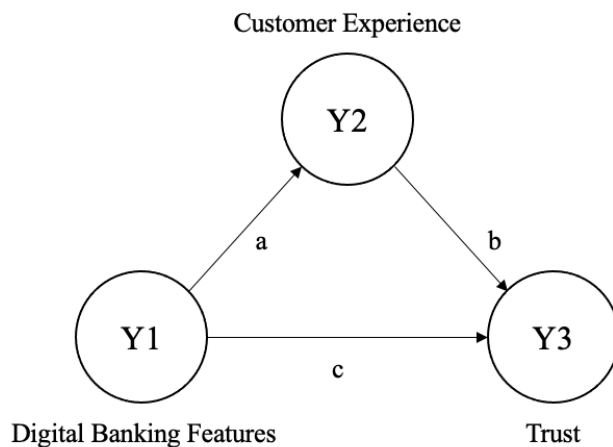
DB Features (Traditional & Sustainability-related)	Average Users	Average Non-Users	Average (Total)
Instant Push Notifications	4,0	3,5	3,8
Free Payments & Money Withdrawals Worldwide	4,5	5,0	4,8
Spending Analysis	4,3	4,0	4,1
Immediate Money Transfer	4,8	4,8	4,8
Customer Service 24/7	4,8	4,8	4,8
Savings Allocation to Favorite Sustainability Projects	4,0	4,3	4,1
CO ₂ -Footprint Measurement	4,3	3,8	4,0
Measurement of SDGs Contribution	4,3	3,5	3,9

Source: Own illustration.

Exhibit 3: Examples of Sustainability Projects

- Rainforest Preservation
- CO₂-Offsetting
- Provision of Clean Drinking Water
- Promotion of Social Housing
- Planting Trees and Creation of New Environmental Ecosystems

Exhibit 4: Mediation Effect Model



Source: Own illustration. Framework retrieved from Baron and Kenny (1986).

Exhibit 5: Main Study – Online Survey (German translation available in Qualtrics link)

Block 1: Consent Form

Dear Participant,

My Name is Federico and I am a MSc Student at Católica Lisbon.

For my final dissertation, I am conducting an analysis on **neobanks and trust perception** in Germany.

In total, it should take around **2-4 minutes** to complete the study.

All collected data is **strictly confidential and anonymous** and will only be used for the purpose of this research. Please **answer truthfully** as there are no right or wrong answers.

Thank you very much for your precious collaboration. If you have any further questions, please contact me at s-fbonanno@ucp.pt.

By moving forward, you voluntarily agree to take part in this study.

Block 2: Market Feasibility

Q1: Are you currently residing in Germany or planning to do so within the next 2 years?

Yes

No

Block 3: Introduction

Q2: Neobanks can be defined as financial institutions that offer their services **fully virtually** (mostly via smartphone) without a network of physical branches.

Examples of neobanks include: **Revolut, N26, DKB, Tomorrow.**

Do you currently use a neobank?

Yes

No

Block 4: Traditional Digital Banking Features

Q3: Below you will find a sequence of **digital banking features** with a short description of their main characteristics. Please select if and how much this feature increases or decreases your **trust level** towards a **neobank** that offers this functionality.

Instant Push Notifications: real-time messages pop-up on your smartphone as soon as financial operations (e.g., money withdrawal, payment, bank transfer) are completed.

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
This neobank is trustworthy	☐	☐	☐	☐	☐
This feature increases my trust level	☐	☐	☐	☐	☐

Q4: Free Payments & Money Withdrawals: you can pay in any currency at the best exchange rate and withdraw money at any ATM globally, for free.

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
This neobank is trustworthy	☐	☐	☐	☐	☐
This feature increases my trust level	☐	☐	☐	☐	☐

Q5: Spending Analysis: the neobank provides you with an overview of your expenses (e.g., weekly, monthly) split by categories (e.g., shopping, transportation, bars & restaurants), directly in the app.

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
This neobank is trustworthy	☐	☐	☐	☐	☐
This feature increases my trust level	☐	☐	☐	☐	☐

Q6: Immediate Money Transfer: you can transfer money to peers from the same neobank in real-time and for free.

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
This neobank is trustworthy	☐	☐	☐	☐	☐
This feature increases my trust level	☐	☐	☐	☐	☐

Q7: Customer Service 24/7: a chatbot, and/or human contact point, is available every day and at any time to solve customer queries via the neobank application.

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
This neobank is trustworthy	☐	☐	☐	☐	☐
This feature increases my trust level	☐	☐	☐	☐	☐

Block 5: Sustainability-related Digital Banking Features

Q8: Savings Allocation to Sustainability Projects: you can partially decide in which SDG-related initiatives (e.g., social housing, rainforest preservation, provision of clean drinking water) your money will be invested.

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
This neobank is trustworthy	☐	☐	☐	☐	☐
This feature increases my trust level	☐	☐	☐	☐	☐

Q9: CO2-Footprint Tracking: your CO2-Index from purchases is compared to a benchmark and more environmentally-friendly product/service alternatives (with similar prices) are suggested, directly in the app.

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
This neobank is trustworthy	☐	☐	☐	☐	☐
This feature increases my trust level	☐	☐	☐	☐	☐

Q10: Impact Measurement of UN Sustainable Development Goals: your personal and the entire user-community's investments, as contribution to the achievement of the SDGs, are illustrated in the app.

	Strongly disagree (1)	Somewhat disagree (2)	Neither agree nor disagree (3)	Somewhat agree (4)	Strongly agree (5)
This neobank is trustworthy	☐	☐	☐	☐	☐
This feature increases my trust level	☐	☐	☐	☐	☐

Block 6: Socio-demographic Characteristics

Q11: Please select you gender:

Male

Female

Other

Prefer not to say

Q12: What is your age?

18-35 years old

36-54 years old

55+ years old

Q13: Please select your current occupation:

Employed

Unemployed

Student

Working Student

Retired

Other

Exhibit 6: Research Sample – Socio-demographic Characterization

		Users	Non-Users	Total
Gender	Male	53	24	77
	Female	18	28	46
	Other	0	0	0
	Prefer not to say	0	1	1
	Total	71	53	124
Age	18 – 35 years old	65	35	100
	36 – 54 years old	4	13	17
	55+ years old	2	5	7
	Total	71	53	124
Occupation	Employed	43	32	75
	Unemployed	0	1	1
	Student	24	11	35
	Working Student	4	6	10
	Retired	0	1	1
	Other	0	2	2
	Total	71	53	124

Source: Own illustration. Statistical data retrieved from SPSS.

Exhibit 7: Traditional DB Features – Results of Levene’s Test

Variables		F	Sig.
DB Feature 1	Equal variances assumed	1.021	.314
	Equal variances assumed not assumed		
DB Feature 2	Equal variances assumed	.002	.965
	Equal variances assumed not assumed		
DB Feature 3	Equal variances assumed	4.473	.036
	Equal variances assumed not assumed		
DB Feature 4	Equal variances assumed	1.704	.194
	Equal variances assumed not assumed		
DB Feature 5	Equal variances assumed	4.943	.028
	Equal variances assumed not assumed		

Source: Own illustration. Statistical data retrieved from SPSS.

Exhibit 8: Traditional DB Features – Group Statistics

Variables	ID	N	Mean	Std. Deviation	Std. Error Mean
DB Feature 1	Users	71	4.27	.670	.079
	Non-users	53	3.76	.757	.104
DB Feature 2	Users	71	4.07	.785	.093
	Non-users	53	3.91	.797	.109
DB Feature 3	Users	71	4.05	.693	.082
	Non-users	53	3.95	.879	.121
DB Feature 4	Users	71	4.18	.708	.084
	Non-users	53	3.92	.848	.116
DB Feature 5	Users	71	4.41	.851	.101
	Non-users	53	3.98	1.028	.141

Source: Own illustration. Statistical data retrieved from SPSS.

Exhibit 9: Sustainability-related DB Features – Results of Levene's Test

Variables		F	Sig.
DB Feature 6	Equal variances assumed	.280	.597
	Equal variances assumed not assumed		
DB Feature 7	Equal variances assumed	.037	.849
	Equal variances assumed not assumed		
DB Feature 8	Equal variances assumed	1.617	.206
	Equal variances assumed not assumed		

Source: Own illustration. Statistical data retrieved from SPSS.

Exhibit 10: Sustainability-related DB Features – Group Statistics

Variables	ID	N	Mean	Std. Deviation	Std. Error Mean
DB Feature 6	Users	71	3.88	.847	.101
	Non-users	53	3.82	.850	.117
DB Feature 7	Users	71	3.61	.898	.107
	Non-users	53	3.39	.891	.122
DB Feature 8	Users	71	3.77	.805	.096

Non-users 53 3.36 .997 .137

Source: Own illustration. Statistical data retrieved from SPSS.

Exhibit 11: One-Way ANOVA – Tests’ Results

Variables		Sum of Squares	df	Mean Square	F	Sig.
DB Feature 1	Between Groups	1.059	2	.529	.941	.393
	Within Groups	68.046	121	.562		
	Total	69.105	123			
DB Feature 2	Between Groups	.633	2	.317	.501	.607
	Within Groups	76.367	121	.631		
	Total	77.000	123			
DB Feature 3	Between Groups	4.370	2	2.185	3.798	.025
	Within Groups	69.622	121	.575		
	Total	73.992	123			
DB Feature 4	Between Groups	1.809	2	.905	1.502	.227
	Within Groups	72.858	121	.602		
	Total	74.667	123			
DB Feature 5	Between Groups	5.651	2	2.826	3.240	.043
	Within Groups	105.526	121	.872		
	Total	111.177	123			
DB Feature 6	Between Groups	.340	2	.170	.235	.791
	Within Groups	87.547	121	.724		
	Total	87.887	123			
DB Feature 7	Between Groups	3.691	2	1.846	2.337	.101
	Within Groups	95.541	121	.790		
	Total	99.232	123			
DB Feature 8	Between Groups	3.989	2	1.995	2.454	.090
	Within Groups	98.349	121	.813		
	Total	102.339	123			

Source: Own illustration. Statistical data retrieved from SPSS.

Exhibit 12: One-Way ANOVA – Results of Levene’s Test

Variables		Levene’s Statistic	df1	df2	Sig.
DB Feature 3	Based on Mean	.128	2	121	.880
	Based on Median	.032	2	121	.968
	Based on Median and with adjusted df	.032	2	99.958	.968
	Based on trimmed Mean	.108	2	121	.898
DB Feature 5	Based on Mean	1.235	2	121	.294
	Based on Median	.665	2	121	.516
	Based on Median and with adjusted df	.665	2	113.801	.516
	Based on trimmed Mean	1.324	2	121	.270

Source: Own illustration. Statistical data retrieved from SPSS.

Exhibit 13: One-Way ANOVA – Results of Tukey’s HSD Test

Variables	Age Groups	Comparison	Mean Difference	Sig.	95% C. I.	
					Lower	Upper
DB Feature 3	18-35 years old	36-54 years old	.482	.044	.01	.95
		55+ years old	.457	.275	-.25	1.16
	36-54 years old	18-35 years old	-.482	.044	-.95	-.01
		55+ years old	-.025	.997	-.83	.78
	55+ years old	18-35 years old	-.457	.275	-1.16	.25
		36-54 years old	.025	.997	-.78	.83
DB Feature 5	18-35 years old	36-54 years old	.565	.059	-.02	1.15
		55+ years old	.473	.401	-.39	1.34
	36-54 years old	18-35 years old	-.565	.059	-1.15	.02
		55+ years old	-.092	.974	-1.09	.90
	55+ years old	18-35 years old	-.473	.401	-1.34	.39
		36-54 years old	.092	.974	-.90	1.09

Source: Own illustration. Statistical data retrieved from SPSS.

VII. REFERENCES

- Akhter, W., Abbasi, A. S., Ali, I., & Afzal, H. (2011). Factors affecting customer loyalty in Pakistan. *African Journal of Business Management*, 5(4), 1167–1174.
- Albashrawi, M., Kartal, H., Oztekin, A., & Motiwalla, L. (2019). Self-reported and computer-recorded experience in mobile banking: A multi-phase path analytic approach. *Information Systems Frontiers*, 21(4), 773–790.
- Ameen, N., Tarhini, A., Reppel, A., & Anand, A. (2021). Customer experiences in the age of artificial intelligence. *Computers in Human Behavior*, 114, 106548.
- Amegbe, H., & Osakwe, C. N. (2018). Towards achieving strong customer loyalty in the financial services industry: Ghanaian top banks' customers as a test case. *International Journal of Bank Marketing*, 36(5), 988–1007.
- Amoako, G. K., Solomon, G. K.-A., Livingstone, D. C., & Neequaye, E. (2019). Relationship marketing and repurchase intention in Ghana's hospitality industry: an empirical examination of trust and Commitment. *Journal of Relationship Marketing*, 18(2), 77–107.
- Aziz, A., & Naima, U. (2021). Rethinking digital financial inclusion: Evidence from Bangladesh. *Technology in Society*, 64, 101509.
- Baabdullah, A. M., Alalwan, A. A., Rana, N. P., Kizgin, H., & Patil, P. (2019). Consumer use of mobile banking (M-Banking) in Saudi Arabia: Towards an integrated model. *International Journal of Information Management*, 44, 38–52.
- Baptista, G., & Oliveira, T. (2016). A weight and a meta-analysis on mobile banking acceptance research. *Computers in Human Behavior*, 63, 480–489.
- Barbera, J., Naibert, N., Komperda, R., & Pentecost, T. C. (2020). Clarity on Cronbach's Alpha Use. *Journal of Chemical Education*, 98(2), 257–258.

- Barnes, S. J., & Corbitt, B. J. (2003). Mobile banking: Concept and potential. *International Journal of Mobile Communications*, 1(3), 273–288.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182.
- Bélanger, F., & Carter, L. (2008). Trust and risk in e-government adoption. *The journal of strategic information systems*, 17(2), 165–176.
- Berraies, S., Yahia, K. B., & Hannachi, M. (2017). Identifying the effects of perceived values of mobile banking applications on customers: Comparative study between baby boomers, generation X and generation Y. *International Journal of Bank Marketing*, 35(6), 1018–1038.
- Bhattacharya, M. (2020, November 17). *Revolut introduces Open Banking for users in Germany*. <https://ibsintelligence.com>. Retrieved April 25, 2022, from <https://ibsintelligence.com/ibsi-news/revolut-introduces-open-banking-for-users-in-germany/>
- Bornstein, M. H., Jager, J., & Putnick, D. L. (2013). Sampling in developmental science: Situations, shortcomings, solutions, and standards. *Developmental review*, 33(4), 357–370.
- Boskov, T. (2019). Virtual banking and financial inclusion. *Research Journal of Finance and Accounting*, 10(13), 39–43.
- Bradford, T. (2020). *Neobanks: Banks by Any Other Name?* Payments System Research Briefing.
- Browne, R. (2021, October 18). *Fintech firm N26 is now worth more than Germany's second-largest bank*. <https://www.cnbc.com>. Retrieved April 4, 2022, from <https://www.cnbc.com/2021/10/18/n26-triples-valuation-to-9-billion-now-worth-more-than-commerzbank.html>

- Browne, R. (2021a, July 15). *Digital bank Revolut valued at \$33 billion in funding round led by SoftBank and Tiger Global*. <https://www.cnbc.com/2021/07/15/digital-bank-revolut-valued-at-33-billion-in-new-funding-round.html>. Retrieved April 25, 2022, from <https://www.cnbc.com/2021/07/15/digital-bank-revolut-valued-at-33-billion-in-new-funding-round.html>
- Busch, T., Bauer, R., & Orlitzky, M. (2016). Sustainable development and financial markets: Old paths and new avenues. *Business & Society*, 55(3), 303–329.
- Cao, X., Yu, L., Liu, Z., Gong, M., & Adeel, L. (2018). Understanding mobile payment users' continuance intention: A trust transfer perspective. *Internet Research*, 28(2), 456–476.
- Chaouali, W., & Souiden, N. (2019). The role of cognitive age in explaining mobile banking resistance among elderly people. *Journal of Retailing and Consumer Services*, 50, 342–350.
- Chauhan, S., Akhtar, A., & Gupta, A. (2022). Customer experience in digital banking: a review and future research directions. *International Journal of Quality and Service Sciences*, 14(2), 311–348.
- Chauhan, Y. (2018, April 19). *How Important Is Digital Banking*. <https://www.techfunnel.com/fintech/how-important-is-digital-banking/>. Retrieved July 7, 2022, from <https://www.techfunnel.com/fintech/how-important-is-digital-banking/>
- Chen, C. C., Hsiao, K. L., & Hsieh, C. H. (2019). Understanding usage transfer behavior of two way O2O services. *Computers in Human Behavior*, 100, 184–191.
- Chiorazzo, V., D'Apice, V., DeYoung, R., & Morelli, P. (2018). Is the traditional banking model a survivor?. *Journal of Banking & Finance*, 97, 238–256.
- Choudary, Y. L. (2013). Impact of e-banking system on the customer satisfaction - a study among the selected customers in Chennai city. *Sona Global Management Review*, 7(2), 21–39.

- Ciunova-Shuleska, A., Palamidovska-Sterjadovska, N., & Prodanova, J. (2022). What drives m-banking clients to continue using m-banking services?. *Journal of Business Research*, 139, 731–739.
- Clowes, E. (2022, May 31). *Deutsche Bank raided in \$1tn greenwashing inquiry*. <https://news.sky.com>. Retrieved September 6, 2022, from <https://news.sky.com/story/deutsche-bank-raided-in-1tn-greenwashing-inquiry-12624792>
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Routledge.
- Crabbe, M., Standing, C., Standing, S., & Karjaluoto, H. (2009). An adoption model for mobile banking in Ghana. *International Journal of Mobile Communications*, 7(5), 515–543.
- Creswell, J. W. (2008). The Selection of a Research Design. *Research Design: Qualitative, Quantitative, and Mixed Method Approaches*, 3, 3–22.
- Deegan, C. (2002). Introduction: The legitimising effect of social and environmental disclosures – a theoretical foundation. *Accounting, Auditing & Accountability Journal*, 15(3), 282–311.
- Deka, G. (2015). Green Banking Practices: A Study on environmental strategies of banks with special reference to State bank of India. *Indian journal of commerce and management studies*, 6(3), 11–19.
- DKB. (n.d.-a). *Deine Vorteile mit dem Aktivstatus*. <https://Bank.Dkb.De>. Retrieved July 14, 2022, from <https://bank.dkb.de/privatkunden/girokonto/aktivstatus>
- DKB. (n.d.). *Digitale Bank*. <https://Www.Dkb.De>. Retrieved June 22, 2022, from https://www.dkb.de/ueber_uns/digitale-bank/
- DKB. (n.d.). *Über uns*. <https://Www.Dkb.De>. Retrieved April 16, 2022, from https://www.dkb.de/ueber_uns/

- Dootson, P. Beatson, A., & Drennan, J. (2016). Financial institutions using social media – do consumers perceive value?. *International Journal of Bank Marketing*, 34(1), 9–36.
- Dowling, J., & Pfeffer, J. (1975). Organizational legitimacy: Social values and organizational behavior. *Pacific sociological review*, 18(1), 122–136.
- El-Gohary, H. (2011). Customer Relationship Management Adoption in Developing Economies: The Case of Egyptian Small Business Enterprises, proceedings of the ISBE 2011 Conference. *Sustainable Futures: Enterprising Landscapes and Communities*, Sheffield, UK, 9–10.
- El-Gohary, H., Thayaseelan, A., Babatunde, S., & El-Gohary, S. (2021). An Exploratory Study on the Effect of Artificial Intelligence-Enabled Technology on Customer Experiences in the Banking Sector. *Journal of Technological Advancements (JTA)*, 1(1), 1–17.
- Ericsson. (2022, February). *Number of smartphone subscriptions worldwide from 2016 to 2027*. <https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/>. Retrieved July 21, 2022, from <https://www.statista.com/statistics/330695/number-of-smartphone-users-worldwide/>
- Evans, J. R., & Mathur, A. (2005). The value of online surveys. *Internet research*, 15(2), 195–219.
- exton consulting. (2021). *EXTON RESEARCH: Report Neobanks 2021 Shifting from growth to profitability*. <http://extonconsulting.com/wp-content/uploads/2021/01/Report-Neobanks-2021.pdf>
- Fathima, J. S. (2020). Challenge management of banking services-with special reference to virtual banking service challenges. *Shanlax International Journal of Management*, 7(3), 57–66.
- Fathollahzadeh, M., Hashemi, A., & Kahreh, M. S. (2011). Designing a new model for determining customer value satisfaction and loyalty towards banking sector of Iran. *European Journal of Economics, Finance and Administrative Sciences*, 28(1), 126–138.

- Fernandes, T., & Pinto, T. (2019). Relationship quality determinants and outcomes in retail banking services: The role of customer experience. *Journal of Retailing and Consumer Services*, 50, 30–41.
- Finnovate Research. (2018, October). *Neo-Banks: Performance and New Ideas*. Finnovate Research – Ideas for financial innovation.
- Foroughi, B., Iranmanesh, M., & Hyun, S. S. (2019). Understanding the determinants of mobile banking continuance usage intention. *Journal of Enterprise Information Management*, 32(6), 1015–1033.
- Fregolente, A., Junqueira, I., & Medeiros, P. Y. (2019). Active and wealthy Brazilian older adults: identity and consumption motivations. *Journal of Consumer Marketing*, 36(5), 633–642.
- French, S., Leyshon, A., & Meek, S. (2013), *The Changing Geography of British Bank and Building Society Branch Networks, 2003-2012*, University of Nottingham, Nottingham.
- Geebren, A., Jabbar, A., & Luo, M. (2021). Examining the role of consumer satisfaction within mobile eco-systems: Evidence from mobile banking services. *Computers in Human Behavior*, 114, 106584.
- Gefen, D., Karahanna, E., & Straub, D. W. (2003). Inexperience and experience with online stores: The importance of TAM and trust. *IEEE Transactions on Engineering Management*, 50(3), 307–321.
- Glushchenko, M., Hodasevich, N., & Kaufman, N. (2019). Innovative financial technologies as a factor of competitiveness. *SHS Web of Conferences*, 69, 43.
- Gorodianska, L., Nosenko, T., & Vember, V. (2019). Neobanks Operations and Security Features. *2019 International Scientific-Practical Conference. Problems of Infocommunications. Science and Technology*, 839–842.

- Grand View Research. (2022, February). *Neobanking Market Size, Share & Trends Analysis Report By Account Type (Business, Savings), By Application (Enterprises, Personal), By Region (Asia Pacific, Europe), And Segment Forecasts, 2022 - 2030*. <https://www.grandviewresearch.com>. Retrieved May 13, 2022, from <https://www.grandviewresearch.com/industry-analysis/neobanking-market>
- Harris, M., Cox, K. C., Musgrove, C. F., & Ernstberger, K. W. (2016). Consumer preferences for banking technologies by age groups. *International Journal of Bank Marketing*, 34(4), 587–602.
- Hassan, H. E., & Wood, V. R. (2020). Does country culture influence consumers' perceptions toward mobile banking? A comparison between Egypt and the United States. *Telematics and Informatics*, 46, 101312.
- Hengstler, M., Enkel, E., & Duelli, S. (2016). Applied artificial intelligence and trust—The case of autonomous vehicles and medical assistance devices. *Technological Forecasting and Social Change*, 105, 105–120.
- Homburg, C., Jozić, D., & Kuehnl, C. (2017). Customer experience management: toward implementing an evolving marketing concept. *Journal of the Academy of Marketing Science*, 45(3), 377–401.
- Hopkinson, G. G., Klarova, D., Turcan, R., & Gulieva, V. (2019). How neobanks' business models challenge traditional banks.
- How to use Moneybeam?* (n.d.). <https://support.n26.com>. Retrieved July 13, 2022, from <https://support.n26.com/en-eu/app-and-features/moneybeam/how-to-use-moneybeam>
- Hoyer, W. D., Kroschke, M., Schmitt, B., Kraume, K., & Shankar, V. (2020). Transforming the customer experience through new technologies. *Journal of Interactive Marketing*, 51, 57–71.
- Ilieva, J., Baron, S., & Healey, N. M. (2002). Online surveys in marketing research. *International Journal of Market Research*, 44(3), 1–14.

- Islam, J. U., Shahid, S., Rasool, A., Rahman, Z., Khan, I., & Rather, R. A. (2020). Impact of website attributes on customer engagement in banking: a solicitation of stimulus-organism-response theory. *International Journal of Bank Marketing*, 38(6), 1279–1303.
- Jamieson, S. (2004). Likert scales: How to (ab) use them?. *Medical education*, 38(12), 1217–1218.
- Jeder hat das Recht auf ein Konto*. (2016, June 17). <https://www.bundesregierung.de>. Retrieved May 22, 2022, from <https://www.bundesregierung.de/breg-de/aktuelles/jeder-hat-das-recht-auf-ein-konto-321068>
- Jun, M., & Palacios, S. (2016). Examining the key dimensions of mobile banking service quality: an exploratory study. *International Journal of Bank Marketing*, 34(3), 307–326.
- Jünger, M., & Mietzner, M. (2020). Banking goes digital: The adoption of FinTech services by German households. *Finance Research Letters*, 34, 101260.
- Juniper Research. (2021, March). *Number of active online banking users worldwide in 2020 with forecasts from 2021 to 2024, by region*. Juniperresearch.Com. Retrieved July 15, 2022, from <https://www.statista.com/statistics/1228757/online-banking-users-worldwide/>
- Kaabachi, S., Ben Mrad, S., & Fiedler, A. (2019). The moderating effect of e-bank structure on French consumers' trust. *International Journal of Bank Marketing*, 38(2), 501–528.
- Kaabachi, S., Mrad, S. B., & Petrescu, M. (2017). Consumer initial trust toward internet-only banks in France. *International Journal of Bank Marketing*, 35(6), 903–924.
- Kagan, J. (2022, April 22). *Chartered Bank*. <https://www.investopedia.com>. Retrieved May 26, 2022, from <https://bit.ly/3z10Se5>
- Karjaluoto, H., Mattila, M., & Pento, T. (2002). Factors underlying attitude formation towards online banking in Finland. *International journal of bank marketing*, 20(6), 261–272.

- Kauflin, J. (2019, November 4). *Dawn Of The Neobank: The Fintechs Trying To Kill The Corner Bank*. <https://Www.Forbes.Com>. Retrieved July 9, 2022, from <https://www.forbes.com/sites/jeffkauflin/2019/11/04/dawn-of-the-neobank-the-fintechs-trying-to-kill-the-corner-bank/?sh=d48240cb0f6f>
- Ketelaar, P. E., & Van Balen, M. (2018). The smartphone as your follower: The role of smartphone literacy in the relation between privacy concerns, attitude and behaviour towards phone-embedded tracking. *Computers in Human Behavior*, 78, 174–182.
- Kim, E., Lin, J. S., & Sung, Y. (2013). To app or not to app: engaging consumers via branded mobile apps. *Journal of Interactive Advertising*, 13(1), 53–65.
- Kim, G., Shin, B., & Lee, H. G. (2009). Understanding dynamics between initial trust and usage intentions of mobile banking. *Information Systems Journal*, 19(3), 283–311.
- Klaus, P., & Maklan, S. (2013). Towards a better measure of customer experience. *International Journal of Market Research*, 55(2), 227–246.
- Kline, A. (2015). Five Reasons You Can't Ignore the Neobanks. *American Banker*, 1(65).
- Knutson, B. J., Beck, J. A., Kim, S. H., & Cha, J. (2007). Identifying the dimensions of the experience construct. *Journal of Hospitality Marketing & Management*, 15(3), 31–47.
- Koibichuk, V., Ostrovska, N., Kashiyeva, F., & Kwilinski, A. (2021). Innovation Technology and Cyber Frauds Risks of Neobanks: Gravity Model Analysis. *Marketing and Management of Innovations*, 1, 253–265.
- Königsfeld, J., & Salomon, L. (2021, February 26). *Building and scaling one of the world's fastest-growing mobile banks*. <https://Www.Mckinsey.Com>. Retrieved April 3, 2022, from shorturl.at/giRZ7
- Koustoulas, A. (2014, December 15). *How to summarise Likert scale data using SPSS*. <https://Achilleaskoustoulas.Com>. Retrieved August 26, 2022, from shorturl.at/ltxY6

- Kotler, P., & Armstrong, G. (2010). *Principles of marketing*. Pearson education.
- Kumar, D. S., Purani, K., & Viswanathan, S. A. (2018). Influences of ‘appscape’ on mobile app adoption and m-loyalty. *Journal of Retailing and Consumer Services*, 45, 132–141.
- Lakens, D. (2013). Calculating and reporting effect sizes to facilitate cumulative science: a practical primer for t-tests and ANOVAs. *Frontiers in psychology*, 4, 863.
- Lee, K. C., & Chung, N. (2009). Understanding factors affecting trust in and satisfaction with mobile banking in Korea: a modified DeLone and McLean's model perspective. *Interacting with Computer*, 21(5/6), 385–392.
- Liang, C., Wang, W., & Farquhar, J. D. (2009). The influence of customer perceptions on financial performance in financial services. *International Journal of Bank Marketing*, 27(2), 129–149.
- Likuev, A., & Bermisheva, P. (2017). *Non-banks: the future or a dead-end development of the banking system*. Wwww.Forbes.Com. Retrieved July 9, 2022, from <https://www.forbes.ru/tehnologii/344459-neobanki-budushchee-ili-tupikovaya-vetv-razvitiya-bankovskoy-sistemy>
- Lin, H. F. (2011). An empirical investigation of mobile banking adoption: The effect of innovation attributes and knowledge-based trust. *International journal of information management*, 31(3), 252–260.
- Lippert, S. K., & Davis, M. (2006). A conceptual model integrating trust into planned change activities to enhance technology adoption behavior. *Journal of Information Science*, 32(5), 434–448.
- Lipton, A., Shrier, D., & Pentland, A. (2016). *Digital banking manifesto: the end of banks?*. USA: Massachusetts Institute of Technology.

- Louche, C., Busch, T., Crifo, P., & Marcus, A. (2019). Financial markets and the transition to a low-carbon economy: Challenging the dominant logics. *Organization & Environment*, 32(1), 3–17.
- Lumpkin, S., & Schich, S. (2020). Banks, digital banking initiatives and the financial safety net: Theory and analytical framework. *Journal of Economic Science Research*, 3(1).
- Malaquias, R. F., & Hwang, Y. (2016). An empirical study on trust in mobile banking: A developing country perspective. *Computers in human behavior*, 54, 453–461.
- Malhotra, N., Sahadev, S., & Purani, K. (2017). Psychological contract violation and customer intention to reuse online retailers: Exploring mediating and moderating mechanisms. *Journal of Business Research*, 75, 17–28.
- Masrek, M. N., Ahmad Uzir, N., & Khairuddin, I. I. (2012, May). Examining trust in mobile banking: A conceptual framework. In *Proceeding of the 18th International Business Information Management (IBIMA) Conference*.
- Mbama, C. I., & Ezepeue, P. O. (2018). Digital banking, customer experience and bank financial performance: UK Customer's perception. *International Journal of Bank Marketing*, 36(2), 230–255.
- McKnight, D. H., & Chervany, N. L. (2001, January). Conceptualizing trust: A typology and e-commerce customer relationships model. *IEEE Proceedings of the 34th Annual Hawaii International Conference on System Sciences*, 10.
- McKnight, D. H., & Chervany, N. L. (2002). What trust means in e-commerce customer relationships. An interdisciplinary conceptual typology. *International Journal of Electronic Commerce*, 6(2), 35–59.
- McLean, G., & Wilson, A. (2016). Evolving the online customer experience... is there a role for online customer support?. *Computers in Human Behavior*, 60, 602–610.
- Menon, A. D. (2018). *Future of Banking*. Tallyx.

- Meyer, T. (2006, February). *Online banking: What we learn from the differences in Europe*. Deutsche Bank Research.
- Moorman, C., Zaltman, G., & Deshpande, R. (1992). Relationships between providers and users of market research: The dynamics of trust within and between organizations. *Journal of marketing research*, 29(3), 314–328.
- Moschis, G. P. (2003). Marketing to older adults: an updated overview of present knowledge and practice. *Journal of Consumer Marketing*, 20(6), 516–525.
- Mostafa, R. B. (2020). Mobile banking service quality: a new avenue for customer value co-creation. *International Journal of Bank Marketing*, 38(5), 1107–1132.
- N26. (2021, December 2). *N26 explores the future of banking with 2021 Global Digital Banking Index*. <https://N26.Com/En-De>. Retrieved April 4, 2022, from shorturl.at/eloSW
- Neobanking - Germany. (n.d.). <https://www.Statista.Com>. Retrieved September 10, 2022, from <https://www.statista.com/outlook/dmo/fintech/neobanking/germany>
- Neuberger, D. (1997). *Direct Banking – A Demand Pull and Technology Push Innovation* (Working Paper No. 05). University of Rostock, Institute of Economics.
- Norman, G. (2010). Likert scales, levels of measurement and the “laws” of statistics. *Advances in health sciences education*, 15(5), 625–632.
- Okunevych, I. L., & Hlivecka, M. O. (2018). Neobank: bubble or paradigm shift? *Economics Bulletin*, 1, 129–137.
- Osunmuyiwa, O. (2013). Online banking and the risks involved. *Research Journal of Information Technology*, 5(2), 50–54.
- Patterson, P. G. (2007). Demographic correlates of loyalty in a service context. *Journal of Services Marketing*, 21(2), 112–121.

- Pleyers, G., & Poncin, I. (2020). Non-immersive virtual reality technologies in real estate: How customer experience drives attitudes toward properties and the service provider. *Journal of Retailing and Consumer Services*, 57, 102175.
- Raghubansie, A., El-Gohary, H., & Samaradivakara, C. (2015). An Investigation of the Evaluation of the Viral Marketing Research. In *Marketing and Consumer Behavior: Concepts, Methodologies, Tools, and Applications* (pp. 201–227). IGI Global.
- Rajaobelina, L., Brun, I., Line, R., & Cloutier-Bilodeau, C. (2020). Not all elderly are the same: fostering trust through mobile banking service experience. *International Journal of Bank Marketing*, 39(1), 85–106.
- Remolina, N. (2020). *Towards a Data-Driven Financial System: The Impact of Covid-19* (Working Paper No. 08). SMU Centre for AI & Data Governance Research Paper.
- Revolut. (n.d.). *One app for all things money*. <https://www.revolut.com>. Retrieved April 25, 2022, from <https://www.revolut.com/about-revolut>
- Roy, M. K., Salam Sarker, M., & Parvez, S. (2015). Sustainability in Banking Industry: Which way to move?. *ASA University Review*, 9(2), 53–69.
- Sanmath, A. (2018). Fin Tech Banking—The Revolutionized Digital Banking. *International Journal of Trend in Scientific Research and Development*, 1(1), 17–20.
- Sarel, D., & Marmorstein, H. (2003). Marketing online banking services: The voice of the customer. *Journal of Financial Services Marketing*, 8(2), 106–118.
- Sha, N., & Mohammad, S. (2017). Virtual banking and online business. *Banks and Bank Systems*, 12(1), 75–81.
- Shabu, K., & Ramankutty, V. (2022). Neobanking in India: Opportunities and Challenges from Customer Perspective.

- Shahid, S., & Paul, J. (2021). Intrinsic motivation of luxury consumers in an emerging market. *Journal of Retailing and Consumer Services*, 61, 102531.
- Shahid, S., Islam, J. U., Malik, S., & Hasan, U. (2022). Examining consumer experience in using m-banking apps: A study of its antecedents and outcomes. *Journal of Retailing and Consumer Services*, 65, 102870.
- Shaikh, A. A., & Karjaluoto, H. (2015). Mobile banking adoption: A literature review. *Telematics and informatics*, 32(1), 129–142.
- Shank, D. B. (2013). Are computers good or bad for business? How mediated customer–computer interaction alters emotions, impressions, and patronage toward organizations. *Computers in Human Behavior* 29(3), 715–725.
- Shankar, A., Datta, B., Jebarajakirthy, C., & Mukherjee, S. (2020). Exploring mobile banking service quality: A qualitative approach. *Services Marketing Quarterly*, 41(2), 182–204.
- Sharma, S. K., & Sharma, M. (2019). Examining the role of trust and quality dimensions in the actual usage of mobile banking services: An empirical investigation. *International Journal of Information Management*, 44, 65–75.
- Shettar, M. R. (2020). Neo Bank: A new landscape. *Journal of Xi'an University of Architecture & Technology*, 12(3), 3843–3847.
- Shrivastava, P., Zsolnai, L., Wasieleski, D., Stafford-Smith, M., Walker, T., Weber, O., Krosinsky, C., & Oram, D. (2019). Finance and Management for the Anthropocene. *Organization & Environment*, 32(1), 26–40.
- Söderström, E. (2009). Trust types: an overview. *Discourses in Security Assurance & Privacy*, 15, 16, 1–12.
- Statista Research Department. (2022, May 24). *Market capitalization of banking market worldwide from 1st quarter 2016 to 3rd quarter 2021*. <https://www.statista.com>.

Retrieved July 20, 2022, from <https://bit.ly/Globalbankingmarketcapitalization2016-2021>

Statistisches Bundesamt. (2022, June). *Population of Germany as of December 31, 2021, by age group*. <https://www.statista.com/statistics/454349/population-by-age-group-germany/> Retrieved September 3, 2022, from

Sullivan, G. M., & Artino Jr, A. R. (2013). Analyzing and interpreting data from Likert-type scales. *Journal of graduate medical education*, 5(4), 541–542.

Swimberghe, K., Darrat, M. A., Beal, B. D., & Astakhova, M. (2018). Examining a psychological sense of brand community in elderly consumers. *Journal of Business Research*, 82, 171–178.

Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International journal of medical education*, 2, 53–55.

Temelkov, Z. (2020). Differences between traditional bank model and fintech based digital bank and neobanks models. *SocioBrains*, 74, 8–15.

Temelkov, Z. (2022). Factors affecting neobanks sustainability and development. *Journal of Economics*, 7(1), 1–10.

Tomorrow. (2021, October). *Tomorrow - Sustainability Report 2020*. Tomorrow GmbH.

Tomorrow. (n.d.). *Banking for a better future*. <https://www.tomorrow.one>. Retrieved May 5, 2022, from <https://www.tomorrow.one/en-EU/>

Tosun, P. (2020). Brand trust for digital-only bank brands: consumer insights from an emerging market. In *ATLAS 7th International Conference on Social Sciences*. ATLAS.

Trivedi, J. (2019). Examining the customer experience of using banking chatbots and its impact on brand love: the moderating role of perceived risk. *Journal of Internet Commerce*, 18(1), 91–111.

- Turel, O., & Connelly, C. E. (2013). Too busy to help: antecedents and outcomes of interactional justice in web-based service encounters. *International Journal of Information Management* 33(4), 674–683.
- Velazquez, P. V., Bobek, V., Vide, R. K., & Horvat, T. (2022). Lessons from Remarkable FinTech Companies for the Financial Inclusion in Peru. *Journal of Risk and Financial Management*, 15(2), 1–46.
- Wang, Y. J., Minor, M. S., & Wei, J. (2011). Aesthetics and the online shopping environment: understanding consumer responses. *Journal of Retailing*, 87(1), 46–58.
- Wearn, R. & BBC. (2016, May 13). *Banks close more than 600 branches over the past year*. <https://www.bbc.com/news/business-36268324>. Retrieved May 24, 2022, from <https://www.bbc.com/news/business-36268324>
- Windasari, N. A., Kusumawati, N., Larasati, N., & Amelia, R. P. (2022). Digital-only banking experience: Insights from gen Y and gen Z. *Journal of Innovation & Knowledge*, 7(2), 100170.
- Wright, K. B. (2005). Researching Internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. *Journal of computer-mediated communication*, 10(3), JCMC1034.
- Zhao, Z., & Balagué, C. (2015). Designing branded mobile apps: Fundamentals and recommendations. *Business Horizons*, 58(3), 305–315.
- Zimmermann, S. (2019). Same same but different: How and why banks approach sustainability. *Sustainability*, 11(8), 2267.
- Zahid, M., Rahman, H. U., Ullah, Z., & Muhammad, A. (2021). Sustainability and branchless banking: The development and validation of a distinct measurement scale. *Technology in Society*, 67, 1–10.