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Mobile App Features in Fashion Retail and Their Impact on User Satisfaction

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Abstract:

The stationary fashion retail sector faces significant pressure from the rise of e-commerce. With the increasing ubiquity of smartphones and mobile applications, the lines between digital and analog spaces are blurring. This shift presents new opportunities for retailers, such as in-app product availability checks and the integration of augmented reality technologies. Fashion retailers are challenged with evaluating numerous possibilities for app development, all while considering their impact on customer satisfaction. This study investigates 15 potential features for fashion retail apps, categorizing them using the Kano model. The analysis reveals that 8 features are excitement generators, 5 are indifferent, and 2 are basic requirements. Specifically, features like coupons, in-app product availability display, and digital receipts were found to contribute most significantly to customer satisfaction. Conversely, the absence of assortment display, product availability information, and store information were identified as major drivers of dissatisfaction. These findings offer crucial insights for the development of effective smartphone applications in the fashion retail industry. Furthermore, the applicability of these insights to other industries and countries represents promising avenues for future research.

Keywords:

Fashion Retail, Mobile Apps, Customer Satisfaction, Kano, Germany

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Introduction

Background and Relevance

Smartphones have become an indispensable part of daily life, with global sales of iPhones exceeding 2.32 billion since 2007 (Balderson, 2023). In Germany, smartphone users reached over 68 million in 2023, projected to grow to 70 million by 2026 (Statista et al., 2023). This widespread adoption is accompanied by a continuous increase in mobile application (app) usage, significantly impacting the stationary retail sector. Notably, the COVID-19 pandemic accelerated this trend, with a study showing a 39% increase in retailer app usage compared to pre-pandemic levels (Sapio Research, 2021).

This paper investigates the functionalities of apps offered by retailers in the fashion and apparel industry and their influence on customer satisfaction. The aim is to provide practical recommendations and stimulate further research. While many retailers offer apps, their functionalities vary widely, ranging from basic store finders to comprehensive multi-channel experiences like "Click and Collect" (Inman & Nikolova, 2017, p.4). Proprietary apps empower retailers to better integrate digital and physical retail, serving as payment tools or for digital receipts (Sinemus et al., 2022, p.428; Wohllebe & Wolter, 2021, p.29f). The pandemic underscored the necessity of mobile commerce (m-commerce), where business transactions occur via smartphone, fostering synergy between e-commerce, brick-and-mortar stores, and mobile platforms. The fashion industry, as a leader in this transition, already conducts most of its online sales through mobile devices and apps (Lau & Ki, 2021, p.1f). Therefore, the selection and implementation of app features are crucial, prompting this study to explore their contribution to satisfaction, multi-channel integration, and innovation.

Aim of Research

Based on existing research on mobile applications in stationary retail, this study addresses the following central research question:

"Which features in the apps of German fashion retailers, designed to support stationary retail, contribute most significantly to enhancing user satisfaction?"

The primary objective is to thoroughly examine user satisfaction with fashion retailer app functionalities, providing practical recommendations for the industry.

Further detailed research questions include:

- Do retailers offer features desired by customers?
- Are features offered because they:
    - provide user value?

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    - cause dissatisfaction in their absence?
    - are innovative?
- Are there age-related differences in satisfaction concerning these functionalities?

Literature Review

Mobile Apps and Their Usage in Retail

Mobile applications ("apps") are compact, user-friendly programs for smartphones (Moormann, n.d.). Defined as downloadable software for mobile devices, apps often feature distinct brand identities (Bellman et al., 2011, p.191). While e-commerce covers all electronic online business, **m-commerce** specifically involves transactions via mobile devices or apps (Wiedmann et al., 2000, p.684). M-commerce surpasses traditional e-commerce due to its locational independence, ease of use, and instant availability, as smartphones eliminate PC boot-up times (Heinemann & Gaiser, 2015, p.111; Wiedmann et al., 2000, p.685). This study examines retailer-provided apps.

Retailers offer dedicated apps, even with mobile-optimized websites, due to inconsistent browser performance and superior app functionality (Heinemann, 2018, p.23; Heinemann & Gaiser, 2015, p.106). Unlike mobile websites, apps leverage smartphone features like **geo-targeting** for location-based content (Heinemann & Gaiser, 2015, p.106). Apps also benefit retailers by enabling direct, personalized push notifications, as app usage implies consent for promotional messages. This establishes a direct communication channel. Customers, in turn, receive an optimized user experience, personalized discounts, and coupons applicable both in-app and in physical stores, fostering synergy between online and offline sales (Fang, 2019, p.2; Heinemann & Gaiser, 2015, p.106; Shankar et al., 2010, p.112; Wohllebe et al., 2021, p.102).

Features of Mobile Apps Across the Shopping Process

Currently, there is no precise, universally accepted definition for "app functionalities" in academic discourse. In this study, the term "app functionalities" refers to the interactive tools, features, or services integrated within a mobile application (app). These are considered distinct components enabling users to interact with the app and smartphone for information retrieval or specific tasks.

The integration of these functionalities aims to expand app offerings and enhance the user experience. Given their diverse purposes, functionalities can be categorized in various ways. This research assigns each function to a specific purchase phase, following Lemon and Verhoef's (2016, p.76; also Puccinelli et al., 2009, p.16; Sinemus et al., 2022, p.424) model of pre-purchase, purchase, and post-purchase phases. Furthermore, the focus is on functionalities identified in the apps of fashion and apparel retailers through the investigation by Grosche and Neudert (2023), as well as those frequently cited in theoretical

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literature. Each function will be precisely explained, highlighting its utility for users and, where applicable, its added value for retailers.

Pre-Purchase

The pre-purchase phase, where customers gather information and plan purchases, is critical for decision-making, aiming to mitigate doubts and guide product selection (Grewal et al., 2013, p.264; Heinemann et al., 2013, p.127; Lemon & Verhoef, 2016, p.76). Retailer support during this phase enhances the shopping experience and strengthens loyalty. The following app functionalities are particularly relevant for apparel retailers, providing information, incentives, and tools to optimize the purchase process:

- **Store Finder/Store-Locator:** Enables users to locate the nearest physical store via interactive maps and navigation, directing customers to brick-and-mortar locations (Heinemann, 2021, p.169; Rieber, 2017, pp.75f; Wandosell et al., 2019, pp.5f).
- **Store Information/Services/Amenities:** Provides details on store branches, hours, and in-store services, streamlining information search and aiding shopping planning. This can highlight value-added services and is often integrated with the Store-Locator (Betzing et al., 2019, p.111; Heinemann, 2021, p.172; Magrath & McCormick, 2013, pp.122f; Wandosell et al., 2019, pp.5f).
- **Product Availability:** Displays in-store product stock, crucial for a multi-channel strategy. This increases customer satisfaction and loyalty by confirming desired product availability, potentially driving in-store visits and additional sales (Betzing et al., 2019, p.111; De Kerviler et al., 2016, p.343; Heinemann, 2021, p.170; Sinemus et al., 2022, pp.427f).
- **Product Catalog/Assortment:** Presents the full product range, allowing users to browse, select, and check availability. This boosts user interest, engagement, and cross-selling (Heinemann, 2021, p.122; Pantano & Priporas, 2016, p.551).
- **Notifications on Physical Events:** Informs users about in-store events like sales or promotions, encouraging participation, increasing footfall, fostering loyalty, and generating sales. Some events may be live streamed within the app (Baier & Rese, 2020, pp.3f; Puccinelli et al., 2009, p.26; Rieber, 2017, p.99).
- **Coupons:** Offers financial benefits and purchase incentives are usable both in-store and in-app, increasing app engagement and sales (G. Taylor & Levin, 2014, p.768; Rieber, 2017, p.76).
- **App-Exclusive Offers:** Provides special discounts solely through the app, strongly incentivizing app-based purchases (Fang, 2019, p.3; Rieber, 2017, p.88; Tan et al., 2022, p.7).
- **Shopping List/Wishlist/Favorites:** Enables users to save and organize products, aiding purchase planning and preference management. This facilitates targeted purchasing for

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providers and can trigger reminder notifications (Heinemann, 2021, p.169; Wohllebe & Wolter, 2021, pp.18f).

- **AR - Interactive Advertising Campaigns:** Utilizes Augmented Reality to deliver interactive advertising, often via QR codes. This enhances app engagement, fosters brand loyalty, and offers added value through immersive experiences (Heinemann, 2021, pp.182f; Tan et al., 2022, p.35).

Purchase

The purchase phase is where customers select and acquire products, necessitating seamless integration of physical stores with app functionalities for an optimized shopping experience (Grewal et al., 2013, pp.266f; Lemon & Verhoef, 2016, p.76). Various app features enhance user experience and provide retailers with valuable customer insights.

- **Product Information/Origin:** Enables users to access detailed product information via item numbers or barcodes, promoting transparency and strengthening loyalty (Grewal et al., 2020, p.3; Heinemann, 2021, pp.80f; Molinillo et al., 2022, p.1).
- **Image Search:** Facilitates product identification through image recognition, enhancing user-friendliness and discovery (Boriya et al., 2019, p.1; Perry et al., 2019, p.180).
- **AR – Virtual Try-On:** Augmented Reality allows users to virtually try on items, aiding pre-purchase assessment and potentially reducing returns for retailers (Heinemann, 2021, pp.180-183; Magrath & McCormick, 2013, p.126).
- **AR – In-Store Navigation:** Uses AR to guide users within stores, simplifying orientation and enabling retailers to collect location data (Deckert & Wohllebe, 2021, pp.22f; Heinemann, 2018, p.119, 2021, p.178; Tan et al., 2022, p.7).
- **App Payment/Scan & Go/Self-Scan:** Allows in-app scanning and payment, offering convenience and reducing wait times for customers, while providing retailers with faster transactions, data collection, and labor cost savings (Deckert & Wohllebe, 2021, pp.25ff; Heinemann, 2021, pp.184f; Inman & Nikolova, 2017, p.6).
- **Gamification:** Incorporates game elements to enhance shopping entertainment, boosting customer loyalty and engagement (Kaur et al., 2023, pp.4f; Magrath & McCormick, 2013, p.125).
- **Service & Appointment Booking:** Enables users to schedule appointments or services like style consultations, simplifying planning for users and offering retailers additional revenue and stronger customer retention (Heinemann, 2021, p.172).
- **Chat Consultation:** Provides AI or human-expert support, improving user assistance, though less common in stationary retail (Baier & Rese, 2020, p.4; Heinemann, 2018, pp.168ff; Rieber, 2017, pp.102-104).

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- **Click & Collect and Click & Reserve** span both pre-purchase and purchase phases, expanding customer reach and potentially reducing returns (Lockie, 2014, p.142).
- **Click & Collect:** Customers order online and pick up in-store, combining online convenience with immediate access and saving shipping costs. This also offers retailers cross-selling opportunities (Baier & Rese, 2020, p.4; Beck & Rygl, 2015, p.177; Deckert & Wohllebe, 2021, p.S30; Lockie, 2014, p.141; Zoll & Marks, 2016, p.206).
- **Click & Reserve:** Customers reserve products online for in-store try-on and payment, providing physical shopping experience and driving store traffic for fashion retailers, increasing the likelihood of additional purchases (Heinemann, 2021, pp.171f; Renker & Maiwald, 2016, p.99).

Post-Purchase

The post-purchase phase aims to ensure customer satisfaction and cultivate long-term brand loyalty (Lemon & Verhoef, 2016, p.76). Key app functionalities in this stage include:

- **Digital Returns & Exchanges:** Streamlines returns and exchanges, enhancing customer loyalty and reducing retailer costs (Magrath & McCormick, 2013, p.122; Sinemus et al., 2022, pp.427f).
- **Digital Receipt:** Offers paperless purchase tracking, boosting transparency for users and enabling retailers to collect data for personalized recommendations and behavioral analysis (Grewal et al., 2017, p.2; Sinemus et al., 2022, p.428; Wohllebe & Wolter, 2021, pp.29f).
- **Loyalty Program/Customer Account/Club/Digital Customer Card:** Incentivizes repeat purchases and loyalty through points or discounts. For retailers, these programs provide valuable customer data for targeted marketing, increasing profitability and fostering long-term relationships (Eriksson et al., 2018, p.514; Heinemann, 2018, pp.66f; Molinillo et al., 2022, p.2; Wohllebe & Wolter, 2021, pp.12f).

User Expectations Regarding Apps in the German Fashion Retail Industry

The retail sector's shift towards an omnichannel landscape integrates all sales channels, fulfilling customer demands for seamless online-to-offline transitions (Schramm-Klein & Wagner, 2016, p.430; Hagberg et al., 2016, pp.3f; Huré et al., 2017, p.1; Sun et al., 2020, p.6). This includes integrating digital functions into physical stores to personalize the shopping experience (Perry et al., 2019, p.169).

In German fashion retail, customers expect seamless digital integration, including current offers, local promotions, and in-store internet connectivity (Baier & Rese, 2020, p.3; Heinemann, 2018, p.377). Younger demographics prioritize online product information, store visit planning, and "Click & Collect" options (Wullf et al., 2018; Boniversum & bevh, 2018).

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The quality and performance of mobile retailer apps are crucial. Apps meeting user expectations foster positive attitudes and encourage repeat usage (Natarajan et al., 2017, p.12). Apps also facilitate integration with mobile payments, loyalty programs, and push notifications, offering an effective marketing channel despite declining email open rates (Perry et al., 2019, p.180). However, excessive push notifications can lead to app deletion (Wohllebe et al., 2021, p.109). Beyond functionality, e-service quality and app design are vital; clear, appealing design, transparent return policies, and attractive offers significantly influence customer perception (Magrath & McCormick, 2013, p.118; Wohllebe et al., 2020, p.158).

Furthermore, Augmented Reality (AR) is increasingly expected for product personalization and virtual try-ons, triggering positive brand and product emotions and boosting transaction likelihood (Pappas, 2018, p.5).

Methods and Data

This section details the research methods employed, focusing on the online survey design and Kano model data analysis.

Research Design

The study adopts a quantitative, applied research design aiming for practical applicability (Döring & Bortz, 2016, pp.182-199). Addressing the primary research question – "Which features in the apps of German fashion retailers, designed to support stationary retail, contribute most significantly to enhancing user satisfaction?" – this empirical field study utilizes the Kano model to capture customer expectations and preferences. This approach enhances result generalizability. Data is collected via a primary analysis through an online survey, ensuring direct participant input and bolstering data validity regarding experiences and preferences in fashion retail apps. This quantitative exploratory analysis aims to derive theories for new practical hypotheses. The study employs a cross-sectional, non-experimental approach, capturing data at a specific point in time to identify target group trends and preferences. The careful selection of criteria, as outlined by Döring and Bortz, reinforces the validity and relevance of the findings.

Research Instruments

Online Survey

An online survey (CAWI – computer-assisted web interview) was chosen for its ability to conduct fully structured written surveys (Döring & Bortz, 2016, pp.401, S.414; Fantapié Altobelli, 2017, p.63). A standardized questionnaire with closed-ended questions was used, presented consistently to all participants (Fantapié Altobelli, 2017, p.67). The survey was developed through a two-stage process,

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including pre-tests with three individuals to ensure quality and clarity (Döring & Bortz, 2016, p.411; Welker & Wünsch, 2010, p.300). Advantages of online surveys include cost-effectiveness, flexible formatting, interactive navigation, automatic filtering, and efficient data processing (Fantapié Altobelli, 2017, pp.63f; Wagner & Hering, 2014, p.662; Welker & Wünsch, 2010, p.492). Challenges include prerequisite technical access and understanding for participants, potential higher costs for survey providers, and difficulty in ascertaining detailed reasons for responses or dropouts due to anonymity (Wagner & Hering, 2014, p.663; Welker & Wünsch, 2010, p.492). The survey was designed and implemented via easyfeedback.de, conducted from November 20 to December 4, 2023 (15 days), and distributed via social media (LinkedIn, Instagram, WhatsApp) and "Clickworker," also utilizing a snowball sampling method.

Sample Selection

A non-probabilistic convenience sampling method was selected for its simplicity and quick access to available participants (Fantapié Altobelli, 2017, p.64). However, this method risks potential sample bias, as participant selection is based on general availability rather than representativeness. This could impair external validity and generalizability, as certain groups may be overrepresented (Döring & Bortz, 2016, pp.305f; Fantapié Altobelli, 2017, p.63; Wagner & Hering, 2014, p.663).

Survey Structure

The survey begins with a welcome explaining its structure, topic, and estimated duration, assuring participants there are no right or wrong answers, and outlining data protection policies. It comprises five sections. The first section queries participants' shopping behavior, specifically their use of retailer apps in conjunction with in-store purchases. A filter mechanism directs respondents: affirmative answers lead to further questions on purchase frequency and phase (Döring & Bortz, 2016, p.406), while others proceed to pre-purchase phase questions. Questions for the three purchase phases are structured according to the Kano model, presenting a functional question (if the feature is present) followed by a dysfunctional question (if absent) (Klausegger & Scharitzer, 2000, p.228; Sauerwein, 2000, pp.39f). Responses use a Likert ordinal scale with options from "That would make me very happy" to "That would bother me a lot" (Döring & Bortz, 2016, pp.269f; Sauerwein, 2000, pp.39f). Demographic data is collected before the concluding remarks. Concise explanations clarify purchase phase terminology for all participants.

Data Analysis using Kano Model

The Kano model, developed by Professor Noriaki Kano, analyzes product attributes' impact on satisfaction by categorizing them based on how their presence or absence affects satisfaction (Kano et al., 1984). It uses two key questions: a functional question assesses reaction to an attribute's presence,

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and a dysfunctional question measures reaction to its absence. This yields six categories, detailed below.

The multifactorial nature of satisfaction explains the differing influences of attributes. While some define satisfaction as a bipolar continuum, others, supported by Herzberg's Two-Factor Theory (which Kano adapted into "Attractive-Must-Be-Quality" in 1984), advocate for a multi-layered structure. The non-linear relationship between requirement fulfillment and satisfaction drives the development of distinct categories (Kano et al., 1984; Marx, 2014, pp.12f; Sauerwein, 2000, pp.27-30). Sauerwein (2000, pp.148ff) analyzed the Kano model's reliability and validity, with validation possible via linear regression or Fong's Test (Fong, 1996).

Kano's model differentiates attribute types based on their impact on customer satisfaction (Sauerwein, 2000, pp.27ff):

- Basic Requirements (Must-be, Dissatisfier): Fundamental criteria whose absence causes significant dissatisfaction. Their presence does not increase satisfaction, but they are competitively essential.
- Performance Requirements (One-dimensional, Satisfier): Linked to satisfaction; greater fulfillment leads to higher satisfaction. These are expected and measurable.
- Excitement Requirements (Attractive, Delighter): Key drivers of satisfaction. Not explicitly expected, their presence significantly increases satisfaction, while their absence causes no dissatisfaction.
- Indifferent Requirements: Have no significant positive or negative effect on satisfaction, whether present or absent.
- Reverse Requirements: Customers desire the opposite of the stated attribute; fulfillment leads to dissatisfaction, while absence leads to satisfaction. These should be rare in study designs.
- Questionable Requirements: Indicate contradictory responses to functional and dysfunctional questions, often due to misunderstanding. Frequent questionable results suggest caution in interpreting respondent data.

Survey results are analyzed using a frequency evaluation table (Table 1), adapted from Berger and Sauerwein. According to Sauerwein (2000, pp.43ff), various methods are available for Kano survey analysis, including frequency analysis, Category Strength, Total Strength, and coefficients for satisfaction and dissatisfaction.

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Feature	Dysfunctional question					
Functional question		I would be very happy about that	I take that for granted	I don't care about that	I could put up with that	That would bother me a lot
	I would be very happy about that	Q	A	A	A	O
	I take that for granted	R	I	I	I	M
	I don't care about that	R	I	I	I	M
	I could put up with that	R	I	I	I	M
	That would bother me a lot	R	R	R	R	Q

Table 1: Frequency evaluation table for Kano analysis

Statistical Evaluation

To determine the final classification of each feature, individual user categorizations are aggregated. An equilibrium rule is then applied to balance the positive attribute categories (Attractive (A), One-dimensional (O), Must-be (M)) against the negative categories (Indifferent (I), Reverse (R), Questionable (Q)). If the cumulative sum of A, O, and M exceeds that of I, R, and Q, the dominant category is identified from the maximum among A, O, and M. Conversely, if the negative sum is greater, the category is derived from the maximum of I, R, and Q.

To assess the statistical robustness of these classifications, several key metrics are computed:

The **Category Strength (CS)** quantifies the significance of a feature's categorization. A CS value exceeding 5% indicates a meaningful classification (Sauerwein, 2000, p. 46):

$$Category\ Strength = \%\ most\ frequent\ category - \%\ second\ most\ frequent\ category$$

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The **Total Strength (TS)** evaluates the overall importance of a feature from the user's perspective. Sauerwein (2000, p. 47) considers a feature relevant if its TS is at least 50%:

$$Total\ Strength = \%\ M + \%\ O + \%\ A$$

The **Satisfaction Coefficient (CS+)** measures a feature's contribution to user satisfaction, with values ranging from 0 to 1 (Sauerwein, 2000, pp. 51f.):

$$CS+ = \frac{A + O}{A + O + M + I}$$

Finally, the **Dissatisfaction Coefficient (CS-)** indicates a contribution to user dissatisfaction, ranging from -1 to 0 (Sauerwein, 2000, p. 52):

$$CS- = \frac{O + M}{A + O + M + I}$$

Results

Data Cleaning

Deviating from traditional data cleaning, this study adhered to Döring and Bortz's (2016, pp.590-593) six methodological criteria. Only fully complete datasets were included, ensuring completeness. Uniformity was maintained through exclusively closed questions, eliminating the need for data transformations. To mitigate multiple participations, a unique URL parameter was assigned per browser session, though re-participation from different browsers or devices remains a possibility. Outliers were addressed by excluding seven participants who completed the survey in under 2 minutes (derived from a median completion time of 00:05:17 and a standard deviation of 00:04:22). Extreme response outliers were not applicable due to the closed-question format. Response pattern plausibility was not assessed conventionally, as questionable responses are inherent to Kano model analysis and retained (Döring & Bortz, 2016, pp.590-593).

Descriptive Statistics and Filter Question Results

Descriptive statistics provide a demographic overview of the 251 successfully completed surveys (from 278 initiated out of 373 visits). Gender distribution was balanced (54% male, 46% female; no diverse), with 57% completing on smartphones and 43% on desktops. Most participants were employed (54%), followed by self-employed (18%) and those in leadership roles (12%). Age distribution showed 39% aged 26-35, and 32% aged 36-45. Based on these data, analyses were stratified into <=35 and >35 age groups.

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Fashion shopping channel preferences varied: 39% preferred brick-and-mortar stores, 38% online shops (web), and 24% apps. While most respondents had purchased clothing online, 65% had used a fashion retailer's app before, during, or after an in-store purchase (n=162). Of these, 48% used apps occasionally, 24% frequently, and 25% rarely. In terms of purchase phase, 50% used the app pre-purchase (e.g., for information), 30% during purchase (e.g., for product details or payment), and 20% post-purchase (e.g., for loyalty programs or returns).

Cross-analyses revealed significant gender differences: 43% of men preferred in-store shopping versus 18% preferring apps, while women showed a more balanced preference (36% online shop, 34% in-store, 30% app). Overall, 74% of women reported app usage in conjunction with in-store purchases, compared to 56% of men. Age also influenced app usage: 92% of 18-25 year olds, 68% of 26-35 year olds, and 52% of 46-55 year olds had combined in-store purchases with app usage.

Kano Model Question Results

The Kano model analysis categorized 15 features across pre-purchase (7), purchase (5), and post-purchase (3) phases. Overall, there were eight Attractive, two Must-be, and five Indifferent requirements (Table 2). Only nine features yielded statistically significant results. Attractive and Indifferent categories predominated. Post-purchase functions, even if not all significant, were largely Attractive. Pre-purchase functions showed a mix of Attractive, Must-be, and Indifferent, while purchase functions were predominantly Indifferent, though four of five were significant.

Age-based analysis showed individuals >35 years old classified three more functions as Attractive than the <=35 group. "Coupons," "Click & Collect," "Virtual Navigation," "Digital Receipt," and "Return Registration" delighted both groups. Additionally, "Store-Locator," "Product Availability," and "Loyalty Program" were Attractive for those >35. The <=35 group had three Must-be functions, while the >35 group had two, with "Assortment" and "Store Information" common to both. "Product Availability" was an additional Must-be for the younger group. Seven Indifferent functions were identified for <=35, five for >35, with "Shopping List," "Virtual Try-On," "App Payment," "Scan & Go," and "Chat Consultation" common to both.

Gender-based analysis revealed men were less delighted than women. Nine functions were Attractive for women, compared to six for men. Common Attractive functions included "Store-Locator," "Coupons," "Click & Collect," "Virtual Navigation," "Digital Receipt," and "Return Registration." Women were additionally delighted by "Store Information," "Product Availability," and "Loyalty Program." Men showed more Indifferent categorizations. Common Indifferent functions for all genders were "Virtual Try-On," "App Payment," "Scan & Go," and "Chat Consultation." Men also categorized "Shopping List" and "Loyalty Program" as Indifferent. "Assortment," "Store Information," and "Product Availability" were Must-

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be for men, while women categorized "Assortment" and "Shopping List" as Must-be. Average percentage values indicated women more often selected Attractive or One-dimensional requirements, while men tended towards Indifferent.

Function	A (%)	O (%)	M (%)	I (%)	R (%)	Q (%)	Category	Fong
Assortment	16	18	48	18	0	0	Must-be	sig.
Store locator	38	12	9	39	1	2	Attractive	n. s.
Store information	25	15	30	28	2	1	Must-be	n. s.
Shopping list	21	9	28	39	2	2	Indifferent	sig.
Product availability	31	23	28	15	2	1	Attractive	n. s.
Coupons	41	20	9	28	1	1	Attractive	sig.
Virtual try-on	35	2	2	58	2	1	Indifferent	sig.
Click & collect	40	10	14	33	1	2	Attractive	sig.
App payment	29	5	6	55	3	1	Indifferent	sig.
Scan & go	38	5	2	52	2	2	Indifferent	sig.
In-store navigation	47	4	2	45	0	1	Attractive	n. s.
Chat consultation	18	1	2	71	8	0	Indifferent	sig.
Bonus program	36	12	11	40	1	1	Attractive	n. s.
Digital receipt	43	12	8	33	3	1	Attractive	sig.
Return registration	33	18	20	27	2	1	Attractive	n. s.

Table 2: Kano frequency table for all respondents

A Continuous Analysis (DuMouchel) assigned the highest positive value to "Product Availability," followed by "Coupons" and "Return Registration." "Chat Consultation" was most indifferent. "Assortment" had the highest dissatisfaction impact if absent, followed by "Product Availability" and "Store Information." Age-specific Continuous Analyses showed "Digital Receipt" as equally valuable as "Product Availability" for the <=35 group, while "Coupons" and "Product Availability" were key for the >35 group. "Assortment" caused the highest dissatisfaction if absent in both groups. "Chat Consultation" and "Virtual Try-On" remained indifferent across both age groups.

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Category Strength and Total Strength

Category Strength (CS) and Total Strength (TS) were analyzed (Table 3). CS indicates the certainty of a category assignment (target >5%), while TS reflects overall user importance (target >50%). The "Chat Consultation" had the most certain CS (Indifferent) and a low TS (21%), indicating low importance. "Assortment" showed high CS (nearly 30%) and TS (81%), clearly identified as a Must-be of high importance. Ten functions had CS >5%, while four functions ("Virtual Try-On," "App Payment," "Scan & Go," "Chat Consultation") had TS <50%.

Function	Category Strength (%)	Total Strength (%)	Category
Assortment	30	81	Must-be
Store locator	1	59	Attractive
Store information	3	70	Must-be
Shopping list	11	57	Indifferent
Product availability	3	82	Attractive
Coupons	13	70	Attractive
Virtual try-on	23	39	Indifferent
Click & collect	7	64	Attractive
App payment	26	40	Indifferent
Scan & go	14	45	Indifferent
In-store navigation	2	53	Attractive
Chat consultation	53	21	Indifferent
Bonus program	5	58	Attractive
Digital receipt	11	63	Attractive
Return registration	6	71	Attractive

Table 3: Category strength and total strength for all respondents

Age-group analysis of CS and TS showed differences. The <=35 group had four functions below 5% CS, while the >35 group had five, with only "Store Information" and "Virtual Navigation" overlapping marginally. "Product Availability" and "Coupons" had CS below 5% for <=35 but high TS (78%, 63%), whereas for >35, these functions had higher CS (12%, 21%) and even higher TS (86%, 75%). For >35,

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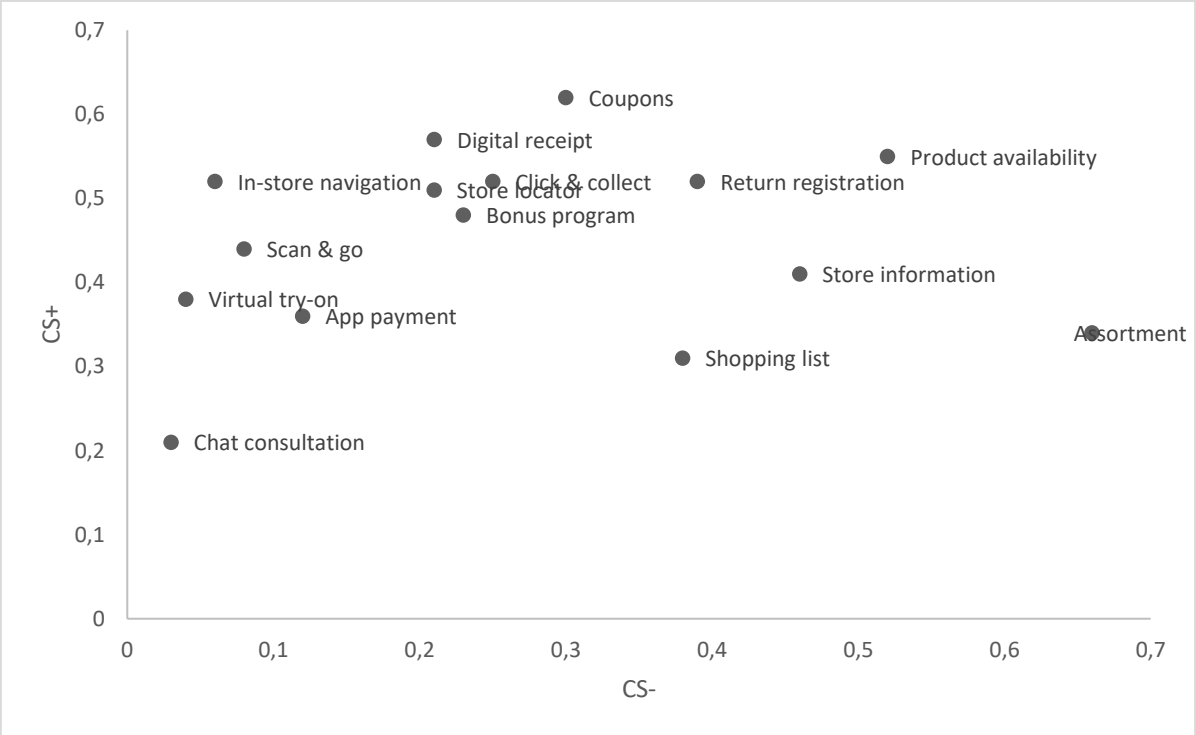
"Loyalty Program," "Digital Receipt," and "Return Registration" had CS below 5%. The >35 group generally assigned higher average TS, indicating greater perceived importance, while the <=35 group had higher average CS, suggesting more categorical agreement.

Satisfaction and Dissatisfaction Coefficients

Analyzing Satisfaction (CS+) and Dissatisfaction (CS-) Coefficients (Sauerwein, 2000, pp.51-54) using a scatter plot (Figure 1, Berger et al., 1993, pp.18f) revealed "Assortment" as the sole Must-be and "Product Availability" as the sole One-dimensional attribute, indicating their strong impact on dissatisfaction if absent. Seven functions are clustered as Indifferent, and six as Attractive. "Coupons" had the strongest influence on satisfaction, consistent with earlier continuous analysis findings. A dense cluster of points appeared between Attractive and Indifferent categories.



"Product Availability" had the highest overall total influence (CS+ + CS- = 1.07), with balanced CS+ and CS- values, meaning it strongly influences both satisfaction and dissatisfaction. "Store Information" and "Shopping List" had similar balanced influences. Functions like "Digital Receipt," "Virtual Navigation," and "Scan & Go" showed larger CS+ than CS- differences (at least 0.35 percentage points), indicating stronger positive influence on satisfaction. Functions primarily affecting dissatisfaction if absent included "Assortment," "Store Information," and "Shopping List."

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Fong-Test

The Fong-Test (Table 2) assessed the statistical significance of feature category assignments (Fong, 1996). For the overall dataset, nine functions were significant, and six were not. For the >35 age group, seven were significant and eight non-significant. The <=35 age group had eight significant and seven non-significant functions. Female participant results mirrored the >35 group's significance, while male results matched the <=35 group. Across all datasets, five classifications were consistently significant: "Assortment" (Must-be), "Virtual Try-On," "App Payment," "Scan & Go," and "Chat Consultation" (all Indifferent).

Discussion

This chapter links the survey findings, derived from the Kano model, with existing research to address the primary research question: "Which functions in the apps of German fashion retailers that support brick-and-mortar retail contribute most significantly to enhancing user satisfaction?" The analysis of 15 functions, categorized across pre-purchase, purchase, and post-purchase phases, revealed eight Attractive, five Indifferent, and two Must-be requirements, with no functions classified as Performance, Reverse, or Questionable.

Expected (Must-be) Functions

"Assortment" and "Store Information" emerged as fundamental (Must-be) requirements. The "Assortment" provides an overview of available products and supports cross-selling (Pantano & Priporas, 2016, p.551), enhancing both sales and satisfaction (Magrath & McCormick, 2013, p.127). With a Total Strength (TS) of 81% and a clear Category Strength (CS) of 30%, its importance is undeniable, and it is widely implemented in existing apps (Grosche & Neudert, 2023). "Store Information," encompassing details from opening hours to service availability, is crucial for customers; its absence can lead to dissatisfaction and lost sales. Although its categorization as a Must-be is not always statistically significant (TS 70%, CS 3%), its importance is recognized (Magrath & McCormick, 2013, p.119; Trivedi & Trivedi, 2018, p.14; Grosche & Neudert, 2023).

Expected and Demanded (Performance) Functions

No analyzed function was classified as a Performance requirement in this study. While these functions directly correlate with user satisfaction, other critical factors like app design, usability, information quality, user experience, and brand representation remain vital for overall satisfaction (Bellman et al., 2011, p.191; Magrath & McCormick, 2013, p.118; Wohllebe et al., 2020, p.158).

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Impact on Satisfaction (Attractive) Functions

Eight functions were categorized as Attractive, significantly increasing user satisfaction when present, but not causing dissatisfaction when absent.

"Coupons," offering financial incentives across channels (Inman & Nikolova, 2017, p.4; Rieber, 2017, pp.75f), were surprisingly classified as Attractive despite their long history (Hartmann et al., 2003, p.112). Their high TS (70%) indicates strong user importance, especially as location-based marketing revitalizes their use (Durst et al., 2019, pp.173f; Heinemann, 2018, p.112). The "Store-Locator" (TS 59%) facilitates coupon redemption and is widely implemented (Wandosell et al., 2019, pp.7f, p.10; Grosche & Neudert, 2023).

"Product Availability" holds the highest TS (82%) among Attractive functions. It is crucial for omnichannel retail, enabling customers to check in-store stock for online-discovered products (Durst et al., 2019, p.135; Heinemann, 2018, p.88). While stores have limited stock (Schramm-Klein & Wagner, 2016, p.437), this feature significantly streamlines the shopping process.

"In-Store Navigation" (AR-based) showed mixed results (CS 2%, TS 53%), indicating participant disagreement, and was not identified in a comparative study (Grosche & Neudert). However, large retailers are implementing it (Inman & Nikolova, 2017, p.4).

"Click & Collect" is an essential omnichannel component (Lockie, 2014, p.141; Wohllebe & Wolter, 2021, p.28; Zoll & Marks, 2016, pp.212f) with a high TS (64%), enabling online ordering with in-store pickup and potential cross-selling (Zoll & Marks, 2016, p.206). It is frequently implemented (Grosche & Neudert, 2023) and logically complements "Product Availability."

Post-purchase Attractive functions include the "Loyalty Program," "Digital Receipt," and "Digital Returns." These contribute to seamless online-to-offline transitions. The "Loyalty Program" (TS 58%, CS 5%) barely qualified as Attractive. "Digital Returns" (CS 6%, TS 70%) is highly valued, likely due to high return rates in German fashion retail (approx. 50%, Heinemann, 2018, p.108), as customers prioritize easy processes (Möhring et al., 2015, p.258). The "Digital Receipt" (TS 63%, CS 11%) is a clear Attractive feature, particularly for younger demographics (TS 70%, CS 18%). These three functions create synergy, boosting satisfaction, loyalty, transparency, and profitability.

Functions Not Influencing Satisfaction/Dissatisfaction (Indifferent)

"Shopping List," "App Payment," "Scan & Go," and "Chat Consultation" were categorized as Indifferent. "Shopping List" (TS 57%) was rated surprisingly high for an Indifferent function, though less relevant for omnichannel fashion. "App Payment" and "Scan & Go" were unexpectedly indifferent despite rising mobile payment trends (Zandt, 2023). Innovative functions like "Virtual Try-On" (AR-based, TS 39%, CS

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23%) and "Chat Consultation" (AI-based, TS 21%, CS >50%) showed low importance, likely due to their novelty and low market penetration.

Functions to Avoid (Reverse)

No functions were categorized as Reverse, meaning none should be actively avoided. "Chat Consultation" showed the highest (but still low) tendency (9%) towards negative impact if present.

Age-Group Differences

Significant differences emerged between participants aged 35 and younger (n=124) and those older than 35 (n=127). The older group identified eight Attractive functions, compared to five for the younger group. For the younger demographic, "Product Availability" was a Must-be, while "Loyalty Program" and "Store-Locator" were Indifferent, suggesting these are either standard or less important due to better alternatives (e.g., Google Maps for store location, Wandosell et al., 2019, pp.7f). Older participants were more impressed by these functions, categorizing them as Attractive. The importance (TS) of "Coupons" and "Loyalty Program" was lower for the younger group (by 12 and 14 percentage points, respectively), while the "Digital Receipt" was significantly more important for the younger group (+15% TS).

Conclusion

This study investigated the impact of individual app functions on user satisfaction within German fashion retail. Utilizing the Kano model, functions—selected from existing literature and an analysis of top German retailers' apps (Grosche & Neudert)—were categorized. Findings revealed two functions as Must-be, eight as Attractive, and five as Indifferent; no functions were classified as Performance or Reverse.

Most functions were identified as Attractive, meaning they enhance satisfaction when present but do not cause dissatisfaction when absent. Notable Attractive functions impacting satisfaction include "Coupons" and "Digital Receipt." Conversely, Must-be functions, essential to avoid dissatisfaction, comprise "Assortment" and "Store Information," highlighting their critical importance for app integration. "Chat Consultation" and "Virtual Try-On" were categorized as Indifferent.

For omnichannel retailers, incorporating innovative functions like "Click & Collect" and "Digital Returns" via the app is crucial. Recommendations, while generally applicable to the fashion industry, should be tailored to specific companies. Furthermore, analyses revealed significant differences in satisfaction across age groups and genders, emphasizing the need to consider target audience demographics in app design and improvement.

Further research is encouraged to periodically re-evaluate app functions' satisfaction impact due to rapid technological evolution. Promising areas include exploring functions within diverse omnichannel approaches, assessing their value to the customer experience, and investigating country-specific differences, especially given the higher innovation observed in Asian and North American markets. Studies on functionality and usability would also yield valuable insights.

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