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Features and Functions of Mobile Health Insurance Apps: User Requirements and Their Influence on User Satisfaction – An Application of the Kano Model

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Abstract:

For health insurance customers, mobile apps play a key role in the digitalization of the healthcare system. Health insurance companies are a central actor and important point of contact for policyholders. However, it is still largely unknown what requirements insured people as users have for mobile apps from health insurance companies. The aim of this paper is therefore to identify app functionalities based on existing literature and the apps offered by German health insurance companies and to investigate the influence of these functionalities on user satisfaction using the Kano model. A total of 21 features were identified. Must-have features include a bonus program, offline functionality, protected personal access and multi-platform compatibility. Only the live chat is identified as a performance / one-dimensional feature. Gamification approaches and a community are indifferent features. The attractive features include pedometers, appointment booking, health record, emergency access and exchange with medical specialists. The results serve health insurance companies and other service providers in the healthcare sector by providing concrete insights for the user-oriented development of mobile apps and digital services in the healthcare sector.

Keywords:

User Requirements, Germany, Healthcare, Mobile Applications

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Introduction

Digitalization in general and the spread of smartphone apps offer numerous potentials in many areas. Examples of the use of mobile apps can be found in stationary retail, banking and education, among others (Dickinson & Bass, 2020; Heerde et al., 2019; Papadakis et al., 2020; Thusi & Maduku, 2020). Mobile apps are also becoming increasingly relevant in the healthcare sector. Examples include disease management, health tracking, mental health, physical fitness, asthma treatment and audiology (Apolinário-Hagen et al., 2018; Birkhoff & Smeltzer, 2017; Chan & Honey, 2022; Cho et al., 2020; Kosse et al., 2020; Ross et al., 2022). The COVID-19 pandemic has made digitalization in healthcare even more relevant (Solopi & Qutieshat, 2023). This applies not only to human medicine, but also to veterinary medicine (Diez, 2020). Depending on the use case, users have very different expectations as to which functionalities they expect from apps in the healthcare sector. Radtke & Wohllebe (2025) state that „desired functions include data entry and automated tracking, reminder and alerting, personalization and customization, education and information as well as data sharing and connectivity“. New technologies open additional new opportunities to develop innovative solutions. Latifi (2025) mentions “artificial intelligence (AI), augmented reality (AR), virtual reality (VR), [and] wearable technologies”, among others.

Mobile apps from health insurance companies represent a field that has hardly been considered in research to date. In many healthcare systems around the world, health insurance companies represent a central administrative authority for patients and doctors. Mobile apps offer insured people the possibility of simple and omnipresent access to the services of their health insurance company. At the same time, health insurance companies are faced with the question of which features policyholders want - and how these features affect policyholder satisfaction.

Against this background, this paper is dedicated to the question of which specific functions or features (hereinafter simply referred to as “features”) users expect from health insurance apps and how these features affect user satisfaction. Based on a review of existing research, the paper first identifies potential features of health insurance apps. The paper then uses an online survey and analyzes the collected data with the Kano model to determine the influence of these features on user satisfaction (Kano et al., 1984; Sauerwein, 2000).

Literature Review

User Acceptance of Mobile Apps

To understand the user acceptance of mobile apps in the context of health insurance companies, the term user acceptance must first be defined in a standardized way. According to a definition by

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ScienceDirect (2025), user acceptance “refers to the process of assessing the quality of […] information technology systems […] against predetermined criteria”. The acceptance of technology leads to the use of this technology. According to the Technology Acceptance Model (TAM) by Davis (1989) , acceptance is determined by perceived usefulness and perceived ease of use. Understanding the TAM and the underlying factors helps technology developers to work towards acceptance and thus the use of the technology (Hafiza Razami & Ibrahim, 2022). According to the TAM, the use of technology is the result of the intention to use technology. The intention to use, in turn, results from the attitude towards the technology, which results from perceived usefulness and perceived ease of use (F. Davis, 1985; F. D. Davis, 1989). Similar relationships and further developments of the model are also taken up in later research, such as by Venkatesh et al. (2003).

For app developers, it is important to understand the expectations of their potential users: On the user side, the comparison of expected performance and actual perceived performance leads to confirmation and concludes to satisfaction (Oliver, 1980). To satisfy the users of health insurance apps, it is also important to understand and implement the specific requirements of these users.

Expectations on Mobile Apps in Healthcare

To better understand the specific expectations of users of health insurance apps, it is first necessary to understand the expectations of the use of apps in the healthcare sector. Basically, it can be stated that patients increasingly expect digital and patient-centered services (Jahn, 2023, p. 291 f.). Stoeckli et al. (2018) point to adjustments to the user interface and a personalized user experience. Various sources also point to the relevance of user-friendliness and good usability (Alqahtani & Orji, 2020; Lazard et al., 2021; Pan & Zhao, 2018). Digital connectivity - and thus interoperability - is of great importance in order to be able to provide holistic care to those with health insurance (Manzeschke, 2020).

Studies of Generation Y show that they want to consciously and actively interact with various players in the healthcare sector and would like to have services such as apps, teleconsultation, smart devices and digital patient records (Kreyenschulte & Bohnet-Joschko, 2022, p. 885 f.). Finally, the positive influence on the success of treatment or the contribution to recovery is central to the perceived value of a (digital) service offering (Becker et al., 2014; Singh et al., 2022). Other sources also cite personal support as an important factor, for example in the field of teleaudiology or the treatment of diabetes (Ross et al., 2022; Torbjørnsen et al., 2019). (IT) security and data protection are also repeatedly cited to increase the acceptance of apps in the healthcare sector (Alqahtani & Orji, 2020; Liew et al., 2019; Pan & Zhao, 2018).

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Features of Mobile Health Insurance Apps

The question of the basic expectations of mobile apps in the healthcare sector is followed by the question of the specific features of mobile health insurance apps to address these (and other) expectations. To develop these features, scientific databases such as SpringerLink, ScienceDirect, PubMed and Cochrane are searched for “digitalization in healthcare”, “e-health” and “healthcare applications”. The search results are narrowed down to the calendar year 2015 or later. The results are shown in Table 1.

The features expand on the findings of Radtke & Wohllebe (2025), which outline the functional requirements for mobile health apps in general, including data entry and tracking, reminders and alerts, visualization, personalization and customization, and data sharing and connectivity.

Methods and Data

Kano Model: Data Collection and Analysis

The Kano model is used to determine the influence of individual features on user satisfaction. The model was developed by Kano et al. (1984) and is based on the idea of distinguishing between “attractive quality” and “must-be quality”. It is based on the two-factor theory of Herzberg et al. (1962), which distinguishes between motivators (lead to satisfaction) and hygiene factors (prevent dissatisfaction) in the context of job satisfaction. The Kano model has also been used repeatedly in application-oriented research in the recent past (Müller et al., 2022; Wang et al., 2024; Wohllebe & Prignitz, 2024).

The data for the application of the Kano model is collected using a survey. A functional question is asked for each feature, which asks about the user's perception of the presence of the feature. This is followed by a dysfunctional question that asks about the user's perception if the feature is not present. Respondents can answer on an ordinal Likert scale with “I would be very happy”, “I assume that”, “I don't care”, “I could put up with that” and “That would bother me a lot” (Marx, 2014, p. 17).

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Feature	Description
Pedometer	Integration of health and fitness trackers, e.g. physical activity, calorie consumption, medical readings (Müller et al., 2022; Wang et al., 2024)
Appointment booking	Appointment booking, e.g. for outpatient visits or hospital stays (Gimpel et al., 2021)
Manual upload	Manual upload of health-related documents (Gimpel et al., 2021)
Health record	Recording of personal and medical data (Gimpel et al., 2021)
Bonus program	Bonus program with incentives for preventive appointments and check-ups (Krüger & Kahl, 2017)
Health check	Query of lifestyle-related data (e.g. smoking) and recording for self-monitoring (Gimpel et al., 2021)
Emergency access	Access to emergency information and medical data for first responders (Gimpel et al., 2021)
Community	Possibility to exchange information with other insured persons (Debon et al., 2019; Gimpel et al., 2021)
Exchange with specialists	Integrated messaging system for communication with medical specialists (Debon et al., 2019; Gimpel et al., 2021; Wang et al., 2024)
Live chat	Live chat with insurance staff (dgroup GmbH et al., 2016)
Personalization	Interface customized to the user (Miller et al., 2016; Pradhan et al., 2021; Wang et al., 2024)
Geolocation	Location sharing to view nearby doctors and pharmacies (Almarshad et al., 2022; Miller et al., 2016)
Directory with healthcare providers	Searchable directory of healthcare providers (Gimpel et al., 2021; Wang et al., 2024)
Offline functionalities	Use of the app with limited functionality even without the Internet (Almarshad et al., 2022; Debon et al., 2019; Goel & Taneja, 2023)
Push notifications	Notifications about current events and changes to the insured status (Debon et al., 2019; Goel & Taneja, 2023; Pradhan et al., 2021)

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Gamification	Game mechanics to motivate users to use the app (Miller et al., 2016; Pradhan et al., 2021; Wang et al., 2024)
Protected personal access	App with password protection against unauthorized access (Almarshad et al., 2022; Gimpel et al., 2021)
Data sharing for doctors	Option to share data with doctors and medical professionals (Gimpel et al., 2021; Mendiola et al., 2015; Müller et al., 2022)
Multiplatform compatibility	Compatibility with iOS, Android and other platforms (Debon et al., 2019; Goel & Taneja, 2023)
Accessibility	Usability even with impairments, e.g. blindness or deafness (Debon et al., 2019; Mendiola et al., 2015)
Settings	Settings for changing e.g. language, date format or currencies (Almarshad et al., 2022; Debon et al., 2019)

Table 1: Potential features for mobile health insurance apps according to literature

A pair of questions is therefore selected for each feature. Based on the answers to the respective pair of questions, the feature is assigned to one of six categories for each interviewee. The following categories are possible:

- Must-Be (M): The feature is taken for granted. Presence does not lead to satisfaction, but non-presence leads to dissatisfaction.
- One-Dimensional / Performance (O): The feature is expected. Satisfaction and dissatisfaction are proportional to the degree of fulfillment of expectations.
- Attractive (A): The feature is not expected. If the feature is present, it leads to satisfaction. However, non-existence does not lead to dissatisfaction.
- Indifferent (I): The feature is not relevant for the user. It has no influence on satisfaction or dissatisfaction.
- Reverse (R): The opposite of a product feature is expected. Presence leads to dissatisfaction; absence leads to satisfaction.
- Questionable (Q): A respondent's answers to the pair of questions do not match. The user may not have understood the question correctly.

Table 2 shows the scheme by which each feature is categorized per user based on the answers to the question pair.

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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 2: Logic for interpreting the answers to the Kano survey

The categorizations of all users are added together for each feature. To create a balance between the positive categories (A, O, M) and the negative categories (I, R, Q), the equilibrium rule is applied:

If the sum of A + O + M is greater than the sum of I + R + Q, the category is determined from the maximum of A, O and M. Conversely, the category is determined from the maximum of I, R and Q if the sum of A + O + M is less than the sum of I + R + Q.

To evaluate the statistical significance of the results, various key figures are also calculated:

The Category Strength (CS) indicates how meaningful the categorization is for the respective features. For a meaningful categorization, CS should be > 5% (Sauerwein, 2000, p. 46):

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

The Total Strength (TS) evaluates the overall relevance of a feature from the user's point of view, whereby Sauerwein (2000, p. 47) assumes a relevant feature from 50% Total Strength:

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

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The satisfaction coefficient (CS+) for a feature indicates how strongly the feature contributes to user satisfaction. The coefficient ranges from 0 to 1 (Sauerwein, 2000, p. 51 f.):

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

The dissatisfaction coefficient (CS-) for a feature indicates how strongly the feature contributes to user dissatisfaction and ranges from -1 to 0 (Sauerwein, 2000, p. 52):

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

Collected Sample

The data for the calculation of the Kano model is collected using an online survey. The survey will be conducted in June and July 2024 and distributed via the personal network. As the survey relates to statutory health insurance apps, privately insured people are excluded from the survey.

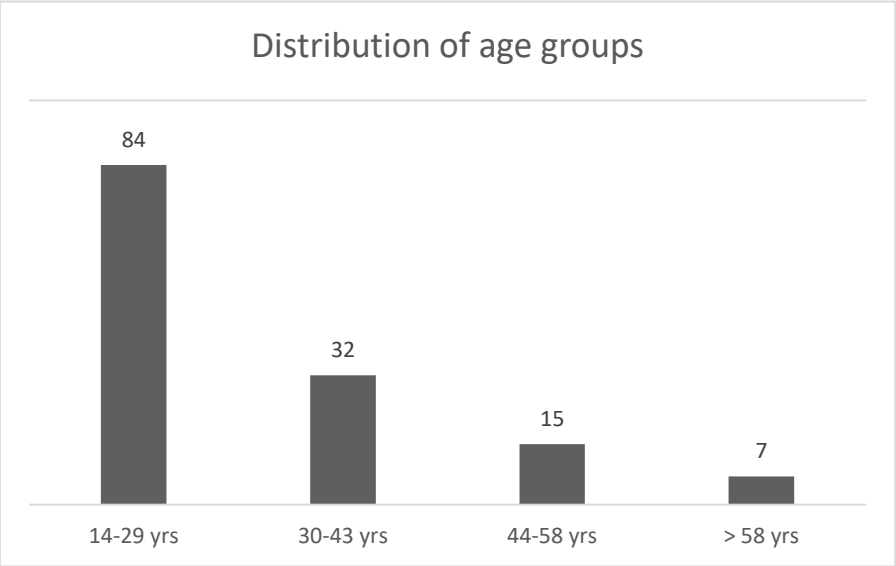

Figure 1: Distribution of age groups (N = 138)

A total of N = 138 people with statutory health insurance responded to the survey. Half of the respondents are female (69), the other half male (69). Figure 1 shows the age distribution.

Results

The features from Table 1 are categorized based on the responses from the survey. Table 3 shows for each feature how many users consider the feature to be M, O, A, I, R or Q. Considering the balance rule, the feature is finally assigned to the category in which most users would classify it.

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Feature	M	O	A	I	R	Q	Cat.	CS	TS	CS+	CS-
Pedometer	8	5	67	45	11	2	A	15.94	57.97	0.58	0.10
Appointment booking	11	14	97	13	1	2	A	60.14	88.41	0.82	0.19
Manual upload	73	22	20	21	1	1	M	36.96	83.33	0.31	0.70
Health record	37	13	46	35	7	0	A	6.52	69.57	0.45	0.38
Bonus program	71	18	22	26	1	0	M	32.61	80.43	0.29	0.65
Health check	0	2	16	56	62	2	R	4.35	13.04	0.24	0.03
Emergency access	0	6	86	41	5	0	A	32.61	66.67	0.69	0.05
Community	1	6	41	82	8	0	I	29.71	34.78	0.36	0.05
Exchange with specialists	13	9	76	35	4	1	A	29.71	71.01	0.64	0.17
Live chat	33	51	42	12	0	0	O	6.52	91.30	0.67	0.61
Personalization	5	14	66	50	2	1	A	11.59	61.59	0.59	0.14
Geolocation	6	6	78	28	19	1	A	36.23	65.22	0.71	0.10
Directory with healthcare providers	9	14	94	20	0	1	A	53.62	84.78	0.79	0.17
Offline functionalities	55	21	14	48	0	0	M	5.07	65.22	0.25	0.55
Push notifications	68	13	9	43	2	3	M	18.12	65.22	0.17	0.61
Gamification	5	1	56	69	7	0	I	9.42	44.93	0.44	0.05
Protected personal access	54	17	12	54	1	0	M	0.00	60.14	0.21	0.52
Data sharing for doctors	4	3	19	51	59	2	R	5.80	18.84	0.29	0.09
Multiplatform compatibility	99	23	7	7	0	2	M	55.07	93.48	0.22	0.90
Accessibility	34	30	41	33	0	0	A	5.07	76.09	0.51	0.46
Settings	84	14	8	30	1	1	M	39.13	76.81	0.16	0.72

Table 3: Summarized results of the Kano survey per feature; with number of categorizations (M, O, A, I, R, Q), final categorization (Cat.) and metrics on the quality of categorization (CS), user relevance (CS) and influence on customer perception (CS+, CS-)

Except for health check and protected personal access, all features were meaningfully categorized (CS > 5%).

The features health check, community, gamification and data sharing for doctors have a TS < 50% and are therefore below the threshold value assumed by Sauerwein (2000, p. 47) The features multiplatform compatibility, directory of healthcare providers, live chat, appointment booking and manual upload are in the top quartile in terms of TS (TS > 80.43%).

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Figure 2: Customer satisfaction (CS+) and dissatisfaction (CS-) coefficients per feature

Figure 2 compares the coefficients for customer satisfaction (CS+) and dissatisfaction (CS-) for each feature. The most important features for customer satisfaction (top quartile, CS+ > 0.64) are appointment booking, emergency access, exchange with specialists, live chat, geolocation and directory with healthcare providers. The most important features for preventing dissatisfaction (lowest quartile, CS- < 0.61) are manual upload, bonus program, live chat, push notifications, multiplatform compatibility and settings.

Finally, the results matrix in Table 4 allows the features to be prioritized on the basis of categorization and total strength (Sauerwein, 2000, p. 48). Protected personal access is not considered here because the results do not allow us to say whether it is a must-be feature or an indifferent feature.

Discussion

Based on the total strength, the results show a high relevance of multiplatform compatibility, directory with healthcare providers, live chat, appointment booking and manual upload. These results confirm the existing research by Debon et al. (2019) and Goel & Taneja (2023) regarding multiplatform compatibility, by Gimpel et al. (2021) and Wang et al. (2024) regarding directory of healthcare providers, regarding

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live chat by dgroup GmbH et al. (2016) and regarding appointment booking and manual upload by Gimpel et al. (2021).

Must-be (M)	One-dimensional (O)	Attractive (A)	Total strength
multiplatform compatibility	live chat		90-100%
manual upload, bonus program		appointment booking, directory with healthcare providers,	80-89%
settings		exchange with specialists, accessibility	70-79%
offline functionalities, push notifications		health record, emergency access, personalization, geolocation	60-69%

Table 4: Results matrix for prioritizing features based on categorization and total strength (Sauerwein, 2000, p. 48)

The low relevance (based on total strength) of other features contradicts the research, for example in the case of health check (Gimpel et al., 2021), community (Debon et al., 2019; Gimpel et al., 2021), gamification (Miller et al., 2016; Pradhan et al., 2021; Wang et al., 2024) and data sharing for doctors (Gimpel et al., 2021; Mendiola et al., 2015; Müller et al., 2022).

These contradictions require further investigation and should therefore be seen as suggestions for future research projects. For example, the question arises as to what extent different age groups differ in their expectations and to what extent the brand image of a health insurance company influences the expectations of users of the mobile app of a specific health insurance company. Another open question - and this is a fundamental challenge of the Kano model - is how exactly the individual features should be developed.

Conclusion

The aim of the paper is to identify features that users expect from mobile health insurance apps and to determine the influence of these features on user satisfaction. In the course of a literature review, 21 potential features are first identified based on existing research. With the help of an online survey, 138 respondents provided information on how the presence and absence of these features would affect their

user satisfaction. The results are analyzed using the Kano model and the features are categorized accordingly.

The results show a high relevance of multiplatform compatibility, directory with healthcare providers, live chat, appointment booking and manual upload.

The theoretical implications lie primarily in the subsequent research questions. These include the question of the different relevance of features depending on the age group as well as the question of the specific design of the features. The question of the influence of health insurance companies on the expectations of their mobile app users also represents a further starting point from a theoretical perspective.

Practical implications can be derived based on the total strength (table 3), the customer satisfaction coefficient (figure 2) and the customer dissatisfaction coefficient (figure 2). From a practical point of view, however, the results matrix in table 4, which prioritizes app development according to Kano category and total strength, is likely to be of the greatest importance. According to this, the focus of development should initially be on multiplatform compatibility (must-have), live chat (one-dimensional), manual upload (must-have) and bonus program (must-have).

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