Identifying consumers of pharmaceutical products and developing their sustainable loyalty

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Abstract. This research addresses a critical issue in the pharmaceutical industry – identifying loyal and consistent customers. Factors such as the need for stable product demand, reduced marketing expenditures, and expanding customer base underscore the significance of this task. Effective pharmaceutical enterprise management hinges on the accurate identification and retention of steadfast customers. The study highlights the complexities within the sector, necessitating targeted customer analysis approaches. It emphasizes the importance of tailored, innovative methods considering the industry's unique regulatory constraints and characteristics. Factor analysis of customer attributes revealed homogenous groups, leading to the development of strategies to enhance interactions and secure the company's market position.

1 The Problem of Accurately Identifying Regular and Loyal Customers in the Pharmaceutical Industry

For sustainable development in the pharmaceutical sector, the timely and unequivocal identification of regular and loyal customers holds significant importance [5]. Regular customers ensure a consistent and stable demand for products, contributing to production continuity and maintaining an adequate level of employment within the industry. Loyal customers, on the other hand, not only utilize the services and products regularly but also recommend them to potential clients, thereby expanding the customer base. However, defining these customer categories in the pharmaceutical industry comes with several challenges. Industry is characterized by high competition and frequent changes in medical practices, which can influence customer preferences and choices. Furthermore, product and service procurement in this sector often depends on decisions made by governmental regulators, medical institutions, and insurance companies, making it difficult to determine customer loyalty levels. In the pharmaceutical sector, the accurate identification of regular and loyal customers is a pivotal task for sustainable business development. This is associated with several fundamental aspects:

1. Steady Demand: regular customers ensure a stable and predictable demand for pharmaceutical company products. This allows businesses to plan production and manage finished product inventories more efficiently, reducing losses from unsold goods.

2. Cost Reduction: acquiring new customers requires substantial expenditures on marketing and advertising. Having a broad base of loyal customers reduces the need to seek and attract new clients, making it more economically advantageous.

3. Expansion of the Customer Base: loyal customers, in addition to making their own purchases, often recommend a company's products and services to their relatives, friends, and acquaintances. Thus, word-of-mouth marketing contributes to the growth of the customer base and can increase a company's profitability.

Nonetheless, the pharmaceutical industry has peculiarities that make identifying regular and loyal customers more complex: (1) luctuations in Medical Practices: changes in clinical recommendations and treatment practices can influence customer choices, making them less predictable; (2) Regulation and Compliance: stringent rules and regulations in the pharmaceutical sector can limit ways of interacting with customers and affect their choices.

When transitioning from analyzing customer identification methods in general businesses to their application in the pharmaceutical industry, it is crucial to consider the industry's specific aspects. While generalized methods may be useful, the pharmaceutical field requires a unique approach to customer analysis due to its high level of regulation, ethical considerations, and complex clinical factors. This underscores the importance of examining the current state of research within the industry on this topic, which will provide a better understanding of which methods are most in demand and effective when dealing with customers in the pharmaceutical sector.

2 Literature Review on Customer Identification in Businesses, with a Focus on the Pharmaceutical Industry

Questions related to customer identification and analysis are becoming increasingly relevant in the formulation of sustainable business development strategies. Despite extensive research in this field, many aspects remain unexplored and require further investigation. The pharmaceutical industry, characterized by strict regulations and rapid changes in medical practice, presents a unique challenge in terms of customer analysis.

In contemporary studies on pharmacy management, such as the work of Krylova and Litvinova [1], the significance of SWOT-analysis as a strategic planning tool in the pharmaceutical sector is emphasized. The authors note that SWOT-analysis enables pharmacies to systematize their strengths and weaknesses, as well as identify opportunities and threats in the market. This assists in the development of more targeted strategies tailored to the unique conditions of the pharmacy business. In the research conducted by Luu Tien Dung [2], the importance of various factors in the successful operation of pharmacies is addressed. The authors highlight that service quality and the availability of a wide range of medicines play a crucial role in satisfying customers and fostering their loyalty. They also note that effective inventory management and adherence to medical standards are equally critical to ensuring the sustainability of pharmacies in today's competitive environment.

A market study of pharmacies conducted by DSM Group (2023) [9] underscores the fierce rivalry among pharmacies, particularly in densely populated urban areas. This competitive environment compels pharmacies to conduct more thorough analyses of their customer base and develop innovative strategies aimed at attracting and retaining customers, which remains the key factor in ensuring the sustainable development of pharmacy businesses.

3 Factor Analysis for Determining Customer Groups

For the effective implementation of branding and positioning strategies, a company must possess a profound understanding of its audience and the market. In this context, marketing

research plays a pivotal role. It provides valuable insights into consumer needs, preferences, behavior, and motivations while helping identify key factors that influence brand formation and reinforcement. The fundamental methods that assist companies in conducting more in-depth and systematic research to comprehend the characteristics and preferences of various consumer segments are factor analysis, discriminant analysis, and cluster analysis. Table 1 presents a comparison of these three methods for identifying consumer groups.

Table 1. Comparison of different statistical analysis methods

Comparison Category	Factor Analysis	Discriminant Analysis	Cluster Analysis
Primary Objective	Identifying hidden factors	Determining significant variables separating groups	Grouping objects into clusters
Application	Examining structure and relationships	Identifying variable importance, classification	Identifying groups of similar objects
Procedure	Factor identification, factor loading assessment	Discriminant function construction, discriminant coefficients calculation	Object separation into clusters based on similarity measures
Input Data	Correlation matrix, observation data	Groups of objects, nominal, or ordinal variables	Similarity or difference matrix between objects
Results	Factor loadings, sum of square loadings, factor scores	Discriminant function, discriminant coefficients, classification matrix	Clusters, groups of objects with common characteristics/behavior

It is worth noting that, unlike factor analysis, discriminant and cluster analyses have more specific goals and objectives. Discriminant analysis aims to determine significant variables that separate groups of objects and classify new objects based on these variables [7]. Cluster analysis, on the other hand, is used to group objects with similar characteristics based on the values of their similarity or difference measures.

Factor analysis stands apart from other methods due to its ability to identify hidden (latent) factors and explore the structure and relationships between variables. It enables the identification of key indicators that accurately describe the studied process or phenomenon, providing researchers not only with the ability to predict its behavior but also to comprehend the general principles of operation of relatively complex and ambiguous entities.

Considering the above, factor analysis appears to be the most powerful and informative tool for studying consumers of pharmaceutical products and services.

4 Experiment Design: Survey Structure, Sample, and Timing

The aim of this research is to develop recommendations for attracting consumers to a regional pharmacy network in the pharmaceutical services market. To achieve this goal, the following objectives were formulated: (1) conduct a survey using a specialized platform; (2) identify key consumer groups based on factor analysis; (3) develop a set of measures for retaining and attracting consumers.

Within the framework of the study, an online survey was conducted using a specialized platform (Google Forms). A questionnaire contained 18 questions was developed and made available for completion by research participants. The survey was conducted over a period of two months, and it garnered participation from 210 respondents. Among them, 56% of the respondents were aged 18-30, 35% were aged 31-50, and 9% were aged 51-71.

Conducting the online survey on the platform allowed for wide coverage and obtaining a representative sample of consumers of pharmaceutical services. The survey results and data

analysis are presented below and serve as the basis for identifying consumer behavior characteristics and providing further recommendations for companies in the pharmaceutical industry. Specialized software was used to extract and analyze the survey data. Orange3 [10] is data analytics software that includes a range of methods for data preprocessing, visualization, statistical analysis, and modeling.

5 Structure of Factor Loadings, Analysis, and Description of Consumer Groups

Based on the factor analysis, consumer groups have been identified for which measures will be developed. The report provides an interpretation of the results of the factor analysis, specifically the values of factor loadings, which represent pairwise correlation coefficients between the identified latent factors and the original characteristics. Table 2 presents the final matrix of factor loadings, including only significant values according to the Bargman test [7].

Table 2. Factor Loadings Matrix

Original Features	Loadings Matrix						
	1	2	3	4	5	6	7
Importance of Product Price	-0.25						
Product Delivery	0.17						
Pharmacy Recommendations	0.21		0.22	0.22			
Age	-0.18		0.19				
Product shortage	0.22			0.19			
Location	0.26					-0.18	
Importance of discounts		-0.21					
Free Product Delivery		0.18					
Concerns About High Prices		-0.25		0.18			
Payment Security		0.18			0.19		
Importance of Product Accessibility		-0.23			0.28		0.30
Gender: Male		0.17				0.19	
Preference for Online Pharmacies		0.20					0.20
Importance of Reputation			0.26				
Low Prices in Online Pharmacies			-0.22				
Attention to Advertising			0.18				
Personal Recommendations			0.18		0.24		0.27
Lack of Information About Products			0.22			0.19	
Purchase of Medical Supplies				0.22			
Income					0.21		
Importance of Product Quality					0.20	0.27	
Importance of Loyalty Programs						0.18	
Opportunity for Medical Testing							0.21

Based on the factor loadings matrix, seven consumer groups were identified. The factors exhibit distinct characteristics, allowing the development of strategies for each group. For the first consumer group, price sensitivity is not significant (factor loading value -0.25 < 0). They value the convenient location of the pharmacy relative to their home (0.26), rely on recommendations (0.21), and face issues with product shortages (0.22). Delivery of orders is also important to them (0.17). This group primarily consists of individuals younger than the average age (under 31 years) without children. For this group, the focus should be on convenient pharmacy locations, personalized recommendations, and information on the availability of required products, taking into account their purchase history. Additionally, developing an efficient order delivery system is recommended.

The second consumer group does not give significant importance to price levels (-0.25). They prefer online pharmacies (0.20) offering free delivery (0.18) and secure payment systems (0.18). This group is predominantly composed of men (0.17) who are not concerned

about discounts (-0.21) and product availability (-0.23). For this group, the emphasis should be on convenient pharmacy locations, providing recommendations, information on product availability, and establishing an efficient order delivery system.

The third consumer group values the pharmacy's reputation (0.26) and personalized advice (0.18). Low prices in online pharmacies are not crucial for them (-0.22), but recommendations from pharmacists are essential (0.22). They also encounter issues with insufficient product information (0.22), and pay attention to advertising (0.18). Recommendations for this group should focus on building a positive reputation, providing personalized advice, ensuring comprehensive product information, and effective advertising.

The fourth consumer group seeks consultations (0.22) and purchases medical supplies (0.22). They face high price issues (0.18) and insufficient information (0.19). The age of consumers in this group is above average (over 31 years). Recommendations for this group should include strategies centered on providing qualified consultations and ensuring comprehensive information about medical supplies.

The fifth consumer group places importance on product variety (0.28). They have above-average income (around 60,000 rubles), value product quality (0.20), secure online payments (0.19), and require consultations (0.24). Strategies for this group should include offering a wide range of products, emphasizing product quality, and providing secure payment options.

The sixth consumer group values loyalty programs (0.18), faces information deficiencies (0.19), and is predominantly male. They prioritize product quality in online pharmacies (0.27), with location being of less significance (-0.18). Leveraging the loyalty orientation of these clients can involve developing special offers and granting personalized privileges related to loyalty program participation.

The seventh consumer group highly values a wide range of products (0.30). They require personalized recommendations (0.27) and seek the possibility of medical examinations (0.21) along with additional products. They expect convenient online ordering (0.20). Offering participation in examinations with the opportunity to acquire additional products or services is recommended for this group.

Marketing strategies tailored to each consumer group have been developed with factor analysis. In Table 3, the following notations are used: "+" denotes a suitable marketing activity, while "−" denotes an unsuitable marketing activity for the consumer group.

Table 3. Proposals suitable for each consumer group

Activities	Consumer Groups						
	1	2	3	4	5	6	7
Website development	−	+	+	−	+	+	+
Partnership with a Medical Center	+	−	+	+	+	−	+
Interactive Touchscreen	+	−	+	+	+	+	+

Various marketing initiatives have been proposed to meet the needs of each customer group. Website development is suitable for consumers in groups 2, 3, 5, and 6, indicating that the website can be beneficial for customers in these groups when obtaining information about products and services. The website is convenient for both young and adult audiences as it allows for faster order placement.

Partnering with a medical center would be of interest to consumers in groups 1, 3-5, and 7, highlighting the potential for mutually beneficial collaboration and meeting their needs. Partnering with a medical center provides the pharmacy with the opportunity to expand its range of services and enhance customer service levels. This collaboration ensures mutual support and mutually beneficial relations between the pharmacy and the medical center.

The interactive touchscreen is attractive to almost all customer groups (1, 3-6, and 7), indicating a wide range of possibilities and applicability for different customer categories. The interactive touchscreen can also provide visitors with additional services. For example,

it can offer customers the option to order pharmaceuticals or other products with home delivery. Additionally, a search function can be integrated so that customers can quickly find the products they need and check their availability in the pharmacy.

6 Conclusion

This research focuses on a pressing issue related to identifying regular and loyal customers in the pharmaceutical industry. The task of categorizing customers in this way has become increasingly important due to various factors, including ensuring a stable demand for medical products, reducing marketing and advertising costs, and the desire to expand the customer base. Effective management of pharmaceutical enterprises is impossible without accurately identifying and retaining regular customers.

The scientific study emphasizes that the pharmaceutical sector faces complexities that make the task of identifying regular customers more challenging and necessitate specialized analysis methods. The work underscores the need for developing individual and innovative approaches to customer analysis in the pharmaceutical industry, taking into account regulatory complexities and the industry's specific characteristics. The statistical analysis of consumer characteristics in the pharmaceutical service sector has enabled the identification of homogeneous customer groups. For each of these groups, a comprehensive set of measures has been developed to strengthen the level of interaction with them and ensure the company's stable position in the market. Undoubtedly, to maintain this position and potentially occupy untapped consumer niches, it is advisable to regularly conduct similar analyses to track not only the current state of the customer base but also to study the dynamics of its composition.

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