Feasibility Study of Buyer Persona Expert System Using a Combination of Segmenting, Targeting, Positioning (STP) and Persona Models

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Abstract. The growth of the digital economy necessitates that businesses gain a deeper understanding of their target market segments. Buyer personas play a crucial role in helping businesses set targets, develop marketing strategies, and make informed decisions. The Buyer Persona Expert System was developed to simplify the process of analyzing market share, enabling business owners to more easily create accurate buyer personas. This expert system functions as an e-business tool designed to support business growth. The research aims to assess the feasibility of using this expert system to analyze market share by generating buyer personas. A qualitative approach was adopted, utilizing data collection methods such as interviews, observations, documentation reviews, and focus group discussions. Feasibility testing was conducted by evaluating customer needs and market conditions, guided by the Segmenting, Targeting, and Positioning (STP) model, with segmenting variables integrated into the Persona model. The results of the feasibility test identified the appropriate market segment for implementing the Buyer Persona Expert System, with findings validated through triangulation techniques involving expert input.

Keywords: Customer Needs, Market Conditions, STP, Feasibility Study, Buyer Persona

1   Introduction

The growth of the digital economy necessitates that businesses better understand their target market (Dewi & Ayuni, 2021; Dewi et al., 2022; Dewi & Ayuni, 2020a; Dewi & Ayuni, 2020b; Brodny & Tutak, 2022). Despite growing technological advancements, research indicates that many businesses continue to rely on outdated methods such as traditional surveys to target their markets, limiting their strategic reach (Nuseir et al., 2023). This reliance reflects a deeper issue, as studies reveal a persistent failure to effectively integrate advanced information technology, marketing, and innovation within the business sector. The lack of synergy between these critical elements not only stifles growth but also hinders businesses from fully leveraging digital tools for competitive advantage (Guiné et al., 2020; Musa et al., 2020; Pasek et al., 2022).

Buyer personas are fictional characters commonly used as design tools across various fields, such as product design, service design, software design, and marketing (Jung et al., 2018; Sinansari et al., 2023). The Buyer Persona Expert System (BPES) was developed to analyze market share, making it easier for business owners to create buyer personas. This expert system serves as an e-business tool to support business development. Initial observations indicate that MSMEs often struggle with allocating time for qualitative research, designing questionnaires, and processing quantitative data. Additionally, many MSMEs lack transaction or social media data that can be used for data-driven decision-making. This data can be utilized to create buyer personas, which serve as an example of Network-Based View (NBV) (Spilotro et al., 2023). Although there may not be sufficient data sources for a data-driven approach, the potential for applying AI to this challenge remains viable. Therefore, it is crucial to develop a knowledge-based expert system that simplifies the process of creating buyer personas for business owners.

The proposed BPES has two end users: business owners and respondents. Business owners are individuals who own businesses and wish to analyze market share by formulating buyer personas. The formulation process begins with distributing an online questionnaire to respondents, provided by BPES. Each piece of data submitted by respondents is automatically used by BPES to formulate the personas. Before the BPES product is launched to users, a feasibility study must be conducted to determine whether the product is suitable for market release. The feasibility variables that can be employed include customer needs and market conditions (McLeod, 2021), (Guiné et al., 2020). The objective of the research is to assess the feasibility of BPES based on these variables. The use of a combination of Segmenting, Targeting, and Positioning (STP) and Persona model for the feasibility study was also the novelty of the research, besides the proposed buyer persona expert system.

2   Methodology

The research adopted a qualitative approach with data collection techniques that included interviews, observations, documentation studies, and focus group discussions. Feasibility testing was conducted by considering customer needs and market conditions, following the Segmenting, Targeting, and Positioning (STP) model. Segmenting variables were combined with the Persona model, where customer needs and market conditions were mapped through STP, incorporating the persona concept. Marketing strategy consists of segmenting, targeting, and positioning (Gupta et al., 2021). These analytical methods are used by companies to define and direct their marketing strategies. Segmentation involves dividing the market into distinct categories based on similar wants and needs (Gupta et al., 2021). Targeting follows segmentation, where marketers select the customer segments they will focus on. Positioning then involves designing marketing strategies tailored to the chosen targets (Gupta et al., 2021).The use of STP is still considered feasible because it provides a valuable foundation for companies as they develop detailed marketing strategies.

A user persona is a representation designed to simplify decision-making communication during project preparation, ensuring it aligns with real-world proportions (Sharp et al., 2024). It represents a character that both the client and design

team can engage with, making it an effective tool in the design process (Sinansari et al., 2023). This method can be used for product development, communication, and reflecting perspectives. The user persona also serves as an archetype for understanding the needs and gathering information about users. It must realistically represent the target user for each specific project.

At this stage, information is filtered and grouped to design the User Persona of the company's consumers. The goal is to identify the objectives, consumer needs, and challenges in achieving these goals. Supporting information from interviews, especially concerning consumer characteristics and needs, is used to design the User Persona. The interview results are grouped according to the requirements of the User Persona design. This design reflects the character and consumer views of the company's services, focusing on an age range of approximately 23-30 years. In the context of a feasibility study, STP can be utilized to analyze customer needs and market conditions, two critical variables in determining business success potential. Through segmentation, the market is divided into smaller groups based on specific characteristics, such as demographics, psychographics, or behavior, which are then used to identify segments with needs and preferences that align most closely with the business offering.
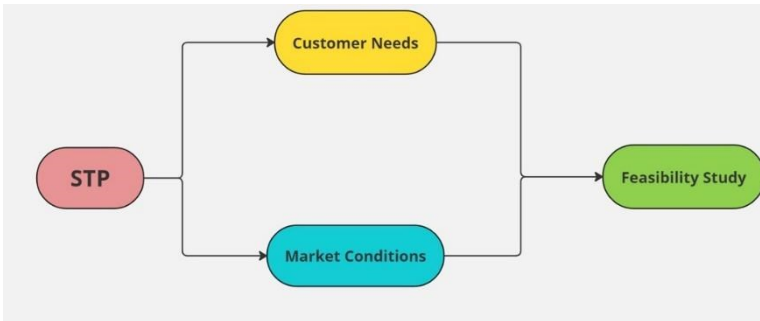

Figure 1. Research framework

User personas, as semi-fictional representations of ideal customers, play a crucial role in mapping these two variables. With detailed information about customer demographics, goals, needs, and challenges, user personas help illustrate how products or services can meet the specific needs of targeted market segments. Additionally, user personas provide insights into how different market segments might respond to various marketing strategies, aiding in the more accurate assessment of market conditions. Thus, user personas serve as an effective tool in linking segmentation analysis with customer needs assessment and market condition evaluation.

By applying STP and user personas in a feasibility study, companies can develop more focused and effective strategies. Segmentation aids in understanding the variations in needs across different market segments while targeting and positioning ensure that products or services are placed in a way that is most appealing to the most profitable segments. User personas, by offering deeper insights into customer preferences and behaviors, enhance the analysis of customer needs and the assessment of market conditions, ultimately improving the accuracy and relevance of the feasibility

study results. This integration enables companies to identify the most promising market opportunities and develop suitable marketing strategies to achieve business success.

3   Result and Discussion

3.1   Result

Previously, a usability testing process was conducted for the Buyer Persona Expert System (BPES). The respondents from this usability testing were subsequently interviewed to conduct feasibility testing. The usability testing aimed to evaluate several key aspects, including Blackbox Testing for Filling Out Questionnaires (Respondents): Assessing the functionality and user experience of respondents filling out questionnaires. Blackbox Testing for Business Registration (Business Owners): Testing the process for business owners to register their businesses within the system. Blackbox Testing for Business Verification (Business Owners): Evaluating the process for business owners to verify their business information. Blackbox Testing for the Inference Engine: Ensuring the accuracy and reliability of the system's inference engine in generating buyer personas. All these aspects were thoroughly tested, and the results were found to be valid, confirming that the BPES functions as intended and meets the required usability standards. A qualitative approach was employed in this study, involving semi-structured interviews and observation with business owners from the manufacturing, information and communication, accommodation and food services, education, and arts, entertainment, and recreation sectors. The interviews focused on the current methods used to understand customer needs, the challenges faced in creating accurate buyer personas, and the perceived value of a buyer persona expert system in enhancing marketing and customer engagement strategies.

The interviews revealed that while business owners recognize the importance of buyer personas, there is a widespread need for more sophisticated tools to develop and utilize them effectively. Traditional methods, such as manual research and customer surveys, were often described as time-consuming and insufficiently precise. A buyer persona expert system was seen as a potential game-changer, capable of analyzing vast amounts of data to generate detailed and dynamic personas that could better inform marketing and product development decisions.

In the manufacturing sector, the business owner highlighted the complexity of targeting both B2B (business-to-business) and B2C (business-to-consumer) markets. A buyer persona expert system could assist in distinguishing between different types of customers and in understanding their specific needs and pain points. By leveraging data-driven insights, the system could help manufacturers tailor their product offerings and marketing strategies to better meet the demands of each segment, ultimately enhancing customer satisfaction and loyalty.

The information and communication sector is characterized by rapid technological advancements and a highly competitive market. The business owners in this industry expressed the need for more precise buyer personas to keep up with the evolving preferences of tech-savvy customers. A buyer persona expert system could provide real-time updates and insights into emerging trends, enabling businesses to stay ahead of the curve by developing products and services that resonate with their target

audience. Additionally, the system could support personalized communication strategies, fostering stronger customer relationships.

The accommodation and food services industry faces unique challenges related to fluctuating customer preferences and seasonal demand. The business owner in this sector emphasized the importance of understanding diverse customer segments, from business travelers to vacationing families. A buyer persona expert system could help in creating nuanced personas that reflect these variations, enabling businesses to design targeted promotions, adjust pricing strategies, and enhance service offerings based on the specific needs of each group.

In the education sector, the business owner discussed the challenges of catering to a wide range of learners, from traditional students to professionals seeking continuing education. A buyer persona expert system could assist in segmenting these diverse audiences and in identifying their distinct learning preferences and goals. This, in turn, would enable educational institutions to develop more effective marketing campaigns, design tailored educational programs, and improve student retention by addressing the unique needs of each persona.

The arts, entertainment, and recreation sectors are driven by the need to constantly innovate and attract diverse audiences. The business owner in this industry highlighted the difficulty of engaging both residents and tourists, each with different interests and expectations. A buyer persona expert system could help in crafting detailed personas that capture the preferences of these varied groups, guiding the development of targeted marketing strategies and customized experiences that resonate with different audience segments.

While each industry has its own specific needs, the common thread across all interviews was the recognition of the limitations of current methods in developing accurate buyer personas. Business owners in all sectors expressed a desire for a more data-driven approach that could provide deeper insights into customer behavior and preferences. A buyer persona expert system was viewed as a valuable tool for overcoming these limitations, offering the potential to enhance customer targeting, personalize marketing efforts, and ultimately drive business growth.

Despite the enthusiasm for a buyer persona expert system, several challenges were identified. These include the need for significant investment in technology and data infrastructure, the complexity of integrating the system with existing business processes, and concerns about data privacy and the ethical implications of using AI-driven systems. Additionally, business owners highlighted the importance of ensuring that the system is user-friendly and accessible to those without advanced technical skills.

The findings of this study suggest that a buyer persona expert system could offer substantial benefits to SMEs across diverse industries. By providing detailed and dynamic insights into customer needs and preferences, such a system could help businesses refine their marketing strategies, improve customer engagement, and enhance overall competitiveness. However, successful implementation will require careful consideration of the associated costs, technological requirements, and ethical considerations.

Table 1. Findings comparison from literature studies and data collection

No	Source	Customet needs	Market condition
1	(Gupta et al., 2021)	Under this theory, marketers are told to try to serve different customers than competitors, and/or to fulfil different customer needs rather than compete 'head on'. Marketers are also urged not to compete on price, but instead to instil loyalty (i.e., repeat purchasing) to inure buyers to competitor marketing activities	
2	(Sharp et al., 2024)	A marketer is asked to find customers different from their competitors.	The marketer is also asked not to compete on price but to enhance loyalty in order to secure repeat orders.
3	Data Collection	A buyer persona expert system could significantly benefit SMEs in various sectors. By delivering in-depth and adaptable insights into customer needs and preferences, this system could assist businesses in fine-tuning their marketing strategies, boosting customer engagement, and improving their overall competitive edge.	In a market where customer needs are continually changing, traditional methods of segmentation, targeting, and positioning might no longer be adequate. The BPES provides a powerful, data-driven solution that helps businesses stay ahead, making it an essential tool for developing buyer personas.

The need for a buyer persona expert system is evident across the various industries studied in this paper. Such a system has the potential to revolutionize the way businesses understand and engage with their customers, providing a more sophisticated and data-driven approach to marketing and product development. While challenges remain, the benefits of implementing a buyer persona expert system could be significant, helping SMEs to better meet the needs of their target audiences and achieve sustainable growth in an increasingly competitive market.

3.2   Discussion

The Sistem Online Single Submission (OSS) system in Indonesia is an essential digital platform that has revolutionized the business registration and licensing process across the country. According to the Ministry of Investment/BKPM, as of 2023, over 10 million business entities have registered through the OSS system, with micro, small, and medium enterprises (MSMEs) comprising approximately 99% of these registrations. This massive industry type provides a detailed snapshot of the Indonesian business landscape, allowing for precise market segmentation based on various criteria such as business size, sector, geographic location, and growth stage. For example, OSS industry types indicate that certain provinces, such as West Java, East Java, Central

Java, and Bali are hotspots for MSE registrations, particularly in the manufacturing, retail, and food and beverage sectors. By utilizing this data, the Buyer Persona Expert System (BPES) can create detailed user personas that reflect the specific needs and characteristics of MSEs in these regions. This segmentation process is crucial because MSEs often face unique challenges such as limited access to financial services, reliance on local markets, and a need for digital transformation to compete effectively (Permana et al., 2023).

In the rapidly growing digital and tech sectors, BPES can identify businesses that are more likely to require advanced technological solutions and digital marketing strategies, whereas MSEs in traditional industries like agriculture or manufacturing might prioritize cost-effective tools and localized support. Targeting involves selecting the most promising segments to focus marketing efforts on (Musa et al., 2020). The OSS industry types provide insights into which sectors and regions are experiencing the most significant growth, allowing businesses to identify high-potential segments. For instance, industry types reference from OSS shows that the technology and service sectors have seen a substantial increase in new registrations, particularly in urban areas like Jakarta, Surabaya, Bandung, and Bali. These sectors are not only expanding rapidly but also represent a market segment with higher adoption rates of digital tools and services.

According to OSS records, startups and MSEs in the tech sector have grown by over 20% annually in the past few years, indicating a robust market potential for digital solutions. By referencing data with BPES, businesses can target these tech-savvy MSEs with precision, offering solutions tailored to their unique needs, such as software for customer relationship management (CRM), digital marketing tools, or cloud-based business management platforms. Furthermore, Startups and young companies, which make up a significant portion of OSS registrations, often require different support services than more established businesses. For example, BPES can help identify segments of young companies that need mentorship, funding opportunities, and scalable solutions, allowing for a targeted approach that meets the specific demands of these emerging businesses.

Positioning involves designing marketing strategies that resonate with the identified target segments (DeSarbo et al., 2019). BPES provides businesses with the ability to craft value propositions that are highly relevant to their target audience. For instance, businesses targeting the manufacturing sector, which according to OSS industry types represents one of the largest segments within the MSE category, can position their products as essential tools for increasing productivity, managing supply chains, or transitioning to Industry 4.0 standards. This is particularly relevant for businesses in regulated industries such as food and beverage, pharmaceuticals, and construction, where compliance with standards is critical. Additionally, the industry types insights from OSS allow for the creation of personas that reflect the evolving needs of businesses as they scale. For example, a company that has recently moved from micro to small enterprise status may require new financial services, more sophisticated marketing strategies, or access to larger markets. BPES can assist in positioning products to meet these transitional needs, ensuring that marketing strategies align with the growth trajectories of the businesses.

The integration of BPES with OSS industry types offers businesses a significant strategic advantage. By leveraging the comprehensive data available through the OSS

system, businesses can enhance their segmentation, targeting, and positioning efforts, leading to more effective and impactful marketing strategies. For instance, the OSS industry types show that the retail sector has seen substantial growth in digital sales channels, indicating a shift in consumer behavior toward online shopping. Businesses can use BPES to develop personas that represent this trend, allowing for the creation of marketing strategies that emphasize e-commerce capabilities, digital payment solutions, and online customer engagement tools. Furthermore, OSS data reveals that businesses in rural areas are increasingly registering for licenses, driven by government initiatives to boost rural economies. BPES can help businesses identify these rural segments and position their offerings to address the unique challenges faced by rural enterprises, such as limited access to digital infrastructure and the need for localized support services.

Based on the descriptions of these two user personas, it can be concluded that the presence of BPES is highly needed in formulating buyer personas. The feasibility study underscores the critical role that BPES plays in modern marketing strategy. By leveraging the system's ability to create accurate, detailed buyer personas, businesses can enhance every aspect of the STP process—segmentation becomes more precise, targeting becomes more effective, and positioning becomes more compelling. In a market landscape where customer needs are constantly evolving, the traditional approaches to segmentation, targeting, and positioning may no longer suffice. The BPES offers a robust, data-driven solution that enables businesses to stay ahead of the curve, making it an indispensable tool for formulating buyer personas. This system not only simplifies the complex process of understanding and categorizing customers but also ensures that marketing strategies are grounded in real, actionable insights.

4   Conclusion

It can be concluded from the research findings that the integration of the Buyer Persona Expert System (BPES) with the Online Single Submission (OSS) industry types represents a transformative approach to market segmentation, targeting, and positioning. By harnessing the detailed data provided by OSS, businesses can achieve highly precise segmentation of micro, small, and medium enterprises (MSMEs) based on their size, sector, and location. This allows for a more nuanced understanding of market dynamics and the specific needs of different business types. For example, while the technology and service sectors in urban areas might demand advanced digital solutions, traditional industries in rural regions may benefit more from cost-effective and localized support. BPES's capability to create detailed, actionable buyer personas based on this data ensures that marketing strategies are not only relevant but also effectively tailored to meet the diverse needs of various market segments. Moreover, the strategic advantage of linking BPES with OSS industry insights lies in its ability to refine targeting and positioning strategies. As businesses can identify high-potential segments with precision, such as the growing tech startups or the expanding digital retail sector, they can craft value propositions that resonate deeply with these targeted audiences. This approach enhances the effectiveness of marketing efforts, making them more impactful and aligned with the evolving needs of businesses. In an era of rapid market changes, BPES provides a robust, data-driven framework that supports

businesses in staying ahead by developing relevant and compelling marketing strategies.

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