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Research Article

Smart Product Marketing Strategy in a Cloud Service Wireless Network Based on SWOT Analysis

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Wireless network systems have multiplied, and mobile communication systems have grown. This article is aimed at developing a cloud-based service wireless network system to smartly market products online. It makes use of cloud services combined with various technologies of the wireless network system. An intelligent product is a device connected to the Internet via sharing information with its users. The usage of smart products has increased day by day, resulting in increased production numbers by various companies. Here, Arises a problem of marketing among huge competition all the manufactured products. So, a marketing strategy has to be designed to market the products. This marketing task can be done using cloud computing services. Cloud computing refers to accessing various computing applications online, such as storing and accessing data, servers, software, databases, and networking. Users can store and access data from a remote server, and there is no need to store it on one's computer hard disc. Large clouds have data centers located at various locations. Data and computing services are available on-demand, whenever they are needed. With the help of a SWOT analysis, this article will investigate smart product marketing strategies in cloud service wireless network systems. The advantages and disadvantages of using the cloud service wireless network system are analyzed based on SWOT analysis. A technically detailed analysis is done by identifying its strengths (S), weaknesses (W), opportunities (O), and threats (T), considering various aspects. In this research, smart product marketing analysis with SWOT is performed to implement a novel hybrid algorithm with the Smart Product Marketing Crisis Prediction (SPMCP) method. For the Smart Product Marketing application, the proposed method is compared with the Ant Colony Optimization (ACO) and has obtained a higher accuracy of 99.54%.

1. Introduction

The cloud service provides virtualized computer resources through the cloud. As a type of internet-based computing, it provides various types of data through user requests (on-demand) to internet-connected virtualized computers [1]. Physical computers are not employed. A "cloud" service not only provides user information (data) via network connection globally but also provides data in various service types [2]. Cloud service providers (CSPs) try to build a marketplace where software can be easily used by their customers and try to acquire a wide variety of software developers. Software developers can achieve global sales at lower costs than conventional software distribution methods by registering their own software in their marketplaces without the need to build separate applications and distribution services [3]. In addition, users can register the required cloud-based software without any time and space constraints. Distribution and technology support do not require separate written contracts or requests and are efficiently provided through the console screens of existing CSPs [4]. In this study, people examine the status of marketplaces built by many CSPs and help software developers select a marketplace suitable for both their purpose of use and business model based on a strength, weakness, opportunities, and threats (SWOT) analysis.

The study of software distribution channels and cloud-based marketplaces concentrated on market research and the distribution status of existing package software [5]. Recently, artificial intelligence (AI) and machine learning technologies are operating in a cloud environment. For practical research analysis, AI is employed in various noninformation technology industries. The author researched distribution channels

and the status of existing package software, and the researcher conducted empirical studies on factors affecting the behavioral intentions of individual users wanting to use SaaS [6]. The author's study confirmed that SaaS provided by recent CSPs has drawn keen attention as a means to enable innovation in the software distribution paradigm, but not many users have actively used it [7]. Regarding the value of the marketplace, the researcher showed that the latest applications—from enterprise software to mobile and social networking—are adopted and available through the cloud, enabling broader adoption and advanced functions [8]. The study also found that the cloud creates a marketplace where more products participate in the service providing process and easily develop applications through reuse and aggregation of services and resources. User-specific items were classified as analytic hierarchy process (AHP) analysis and study requirements of specific user groups [9]. The level of security required by cloud users and the need for management policies are emphasized and analyzed; the study enables users to standardize the criteria and requirements for choosing security services in a cloud marketplace. We conducted an analysis and case study of independent software vendors' specific software on cloud platforms and confirmed the need for policies and software that meet the requirements of specific industrial environments [10]. While marketplace definition and analysis data have been reported in previous studies, this study directly analyses the marketplaces of major local and global CSPs. Discussion of practical registration methods and suggestions of major marketing strategies via SWOT analysis differentiates this study from previous ones [11]. The objectives of the study are to help the customers in understanding the product marketing strategy in the market. This classification can be done by using artificial intelligence with WSN techniques.

2. Literature Review

A SWOT analysis is a method of assessing a system's strengths and weaknesses in order to submit them for review. SWOT analysis is most commonly used to evaluate the current situation of the market before entering it [12]. There is a requirement to have a basic understanding of the cloud and its services before entering the cloud ecosystem. Because of this, we are attempting to evaluate cloud computing using the SWOT norm [13]. During our research, people found a variety of viewpoints on cloud computing. Others, however, viewed it as a negative, or at the very least unfavorable, option. As a result, because of the wide range of perspectives, we decided to conduct a SWOT analysis on cloud computing. SWOT analysis is a well-known strategy formulation tool. The goal of a SWOT analysis is to determine a company's assets and liabilities as well as potential opportunities and dangers in the external environment. Following the identification of these elements, solutions are established that may build on the strengths, eradicate the flaws, take advantage of the opportunities, or counter the dangers. Internal and external assessments are used to identify the organization's strengths and shortcomings, as well as its opportunities and dangers [14].

The following is an example of how to promote your catering services to local businesses for the forthcoming holidays. Location (strength) and opportunity (opportunity) are combined in this strategy (upcoming holidays). In order to overcome real or perceived weaknesses, it is necessary to take advantage of external possibilities [15]. As an example, use social media and free samples at surrounding office buildings to advertise breakfast options and catering services at a low or no-cost price. It incorporates both strengths and weaknesses (holidays, ingredients, and small advertising budget). Make use of your strengths in order to avoid being damaged by threats. Use social media to highlight the quality of the ingredients and the fact that the company is a local institution. When compared to national chains in the area, local resources and a strong location are advantages (threats) [16]. Recognize ways to strengthen weak points in order to avert danger. Participate in local fairs and festivals, farmers' markets, and volunteer opportunities to maintain a presence in the community. In this way, the threat posed by national chains can be avoided because these chances are low-cost while still building a strong local following. It incorporates flaws (no advertising budget) and threats (no advertising budget) (losing market share to local chains) [17]. In order to build a plan and make the greatest use of resources, the SWOT analysis looks both internally (at strengths and weaknesses) and outward (at opportunities and threats). The organization has control over its strengths and weaknesses, but opportunities and threats are things that the company cannot control but should be aware of.

In general, the nation's image and identity can be boosted, the environment preserved, the creative spirit nurtured, and social tolerance increased at all levels of society as a result of increased cross-cultural understanding with the support of creative economy. Indonesia's competitiveness and societal well-being are predicted to be enhanced by innovative economics till 2025 [18]. Human resources (creative people) and scientific knowledge, including cultural legacy and technology, can be used to create value addition in the creative economy, which can therefore be defined as "creating value addition based on the idea that was created by human resources' creativity [19]." As a creative economic resource, the ability to generate or create something unique, to solve a problem, or do something different from the norm is the most important one (thinking outside the box). When an old invention is put to creative use, new ideas begin to take shape. A product or method that is better, more valuable, and more useful is the result of a creative process that incorporates existing inventions. However, in order for an innovation to be considered a work of art that has a specific purpose, it must be something that has never existed before. As a result, fostering the emergence of effective and competitive ideas necessitates a strong focus on creativity [20]. The creative industry and the creative economy are intertwined, although the creative economy encompasses a broader range of activities. In the creative economy, the creative value chain, nurturing environment, market, and archiving are all interdependent. The term "creative economy" encompasses not only economic value contributed but also social, cultural, and environmental value added. The creative

economy, in addition to enhancing Indonesia's competitiveness, can also improve the nation's quality of life. The creative economy, to which the term "creative industry" refers, includes the core creative industry as well as forward and backward linkage creative industries. A core creative industry is one in which the primary source of added value is the use of the individual's own creative abilities. Core creative industries require input from other industries in order to create value. The term "backward linkage creative industry" refers to industries that act as inputs to the core creative industries. Core creative industry output can also be used as input for other industries, which is referred to as the "forward linkage creative industry [21]." It may be concluded that the 15 creative industrial groups are interconnected, despite the fact that each of these industries has a unique set of industrial features. Value creation in the creative economy is facilitated by the creative industry. Aside from commercial transactions, social and cultural exchanges are also made in the process of creating creative value. Each creative industry has a unique creative value chain, which includes the development, production, distribution, and commercialization stages. By taking this information into consideration, "an industry which creates an output through the exploitation of creativity, skills, and individual talents to create value-added, employment, and an enhanced quality of life" is the definition given to the creative industry [22]. Boosting the competitiveness and dynamism of local creative enterprises can be done in three ways: encourage creative entrepreneurship by providing experienced business mentors from throughout the country and world, so that local entrepreneurs can become more competitive. Increase local, national, and worldwide creative entrepreneurship collaboration, cooperation, and partnership networks. All stakeholders are involved and professionally handled the development of business incubators. As a result of the foregoing analyses, business incubators were formed in a number of places throughout Java and Bali [23]. There was a BCIC on the island of Bali (Bali Creative Industry Center). There was an MCF in the city of Malang (Malang Creative Fashion). An incubator is a formal environment designed to stimulate the growth and development of new and early-stage companies by increasing their opportunities for the acquisition of resources that are aimed at facilitating the development and commercialization of new products, new technologies, and new business models. Business incubation is also a social and management process that is aimed at promoting innovative product creation and commercialization, as well as the introduction of novel technology. Small- and medium-sized businesses (SMEs) can benefit from these initiatives, which provide services to help them get off the ground [24]. As part of this, the programme provides incubation with startup and company planning, as well as consulting in all critical areas of business development, growth, and funding. As an incubator, it primarily supports the growth of new businesses by providing networking opportunities. Even while incubators and incubates are both internal (incubators and incubatees), they also support a wide range of external (local and international) networks. Increase the external networks, promote the startup creativity in the selection of partners, and involve the startup in the incubator [25]. The study focused on a smart product marketing strategy in a cloud service wireless network based on SWOT analysis.

3. Motivation for the Study

Smart product marketing strategy research decisions are typically based on classification techniques that classify a set of measurements. Using historical data, various data classification methods are used to determine an organization's overall smart product marketing strategy. It is critical to identify suitable parameters (features) that are critical for developing an accurate Smart Product Marketing Crisis Prediction (SPMCP) method. This is known as an "attribute selection problem," and it helps improve the classifier's performance. The novel hybrid algorithm proposed with the SPMCP model is divided into two parts: novel hybrid algorithm-based feature extraction and novel hybrid algorithm-based data preprocessing. Implementing the novel hybrid algorithm with information to identify and categorize processes within that suggested work includes the following procedures: the novel hybrid algorithm performs feature extraction and selects the best subset of attributes.

4. Materials and Methods

The proposed model in Figure 1 uses the cloud service wireless network system in smart product marketing, and the process is analyzed using SWOT analysis. This type of marketing system is fully digital and uses trending technologies such as Internet technology, cloud computing, and wireless network communication systems. Products are launched online on websites and video sharing platforms and made to reach consumers via social media platforms. There is no physical launch in the markets, stores, or showrooms. The product will be available digitally. If the consumer likes the product after studying the information and specifications, they can order it. Here comes the use of wireless network systems like mobile communications. Product orders can be placed from customers' mobile phones or laptops. It reaches the marketer via the cloud and delivers the product to the consumer in the buying process. In some cases, products are manufactured on order, and in such cases, the marketer or dealer will inform the manufacturer about the order. Products are delivered to customers with the same ease and convenience as in the past. Cloud computing allows users to access various computing applications online, such as storing and accessing data, servers, software, databases, and networking. Likewise, cloud marketing also uses the above computing applications and market products through online applications, social media, web stores, and e-commerce platforms. The computing applications of the cloud are as follows.

Cloud computing has already expanded its territory in the waters of Internet technology, as in Figure 2. It has been used by many top companies. There is no need for the user to download software and install it on their computer. Cloud computing efficiently provides these services. Since the usage of cloud computing has been increased, the cloud service

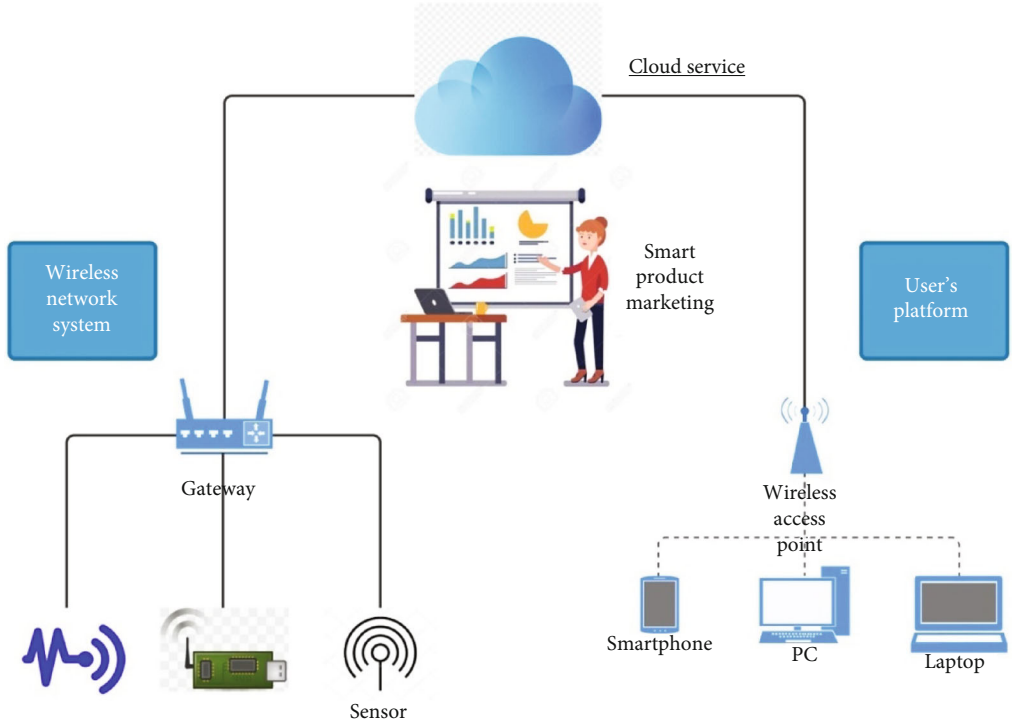

Figure 1: Architecture diagram of a smart product marketing strategy in cloud service wireless networks.

Figure 2: Applications of cloud service wireless networks.

wireless network systems have to be analyzed with the help of SWOT analysis. SWOT analysis finds out the strengths, weaknesses, opportunities, and threats of cloud computing systematically. SWOT analysis is a strategic planning and management tool used to assist an organization in identifying and evaluating its strengths, weaknesses, opportunities, and threats related to business competition or project planning. It is also termed "situational analysis." SWOT analysis assesses internal and external factors and gives detailed insights into future growth. It is always recommended that SWOT analysis be used as a pathfinder to get proper insights.

The SWOT analysis for the proposed model is given in Figure 3, and the points are as follows:

(1) Strengths: the whole proposed process itself is a cost-effective model. In traditional marketing, products are manufactured according to need, rough population, consumer strength, potential to buy, economy, and other factors. Products are manufactured on a large scale and marketed through the dealership. Through our proposed system, we would introduce the products to the customers through an online platform. Customers can order and get it delivered. No unnecessary costs are needed in mass manufacturing, marketing, etc. Customers can get their products in a customized way. For example, say a customer needs a newly launched bike customized. The customer can customize the bike using the web tools available on the bike company's website before placing the order. Companies can manufacture products on account of bookings and orders. This will also be a cost-efficient model. The whole process of the proposed model itself is a time-saving model

(2) Weakness: sometimes the data and information provided in online marketing are misleading. Fact checking should be done in some cases. The locations of the marketers are unknown, which is a disadvantage. This type of marketing can reach only

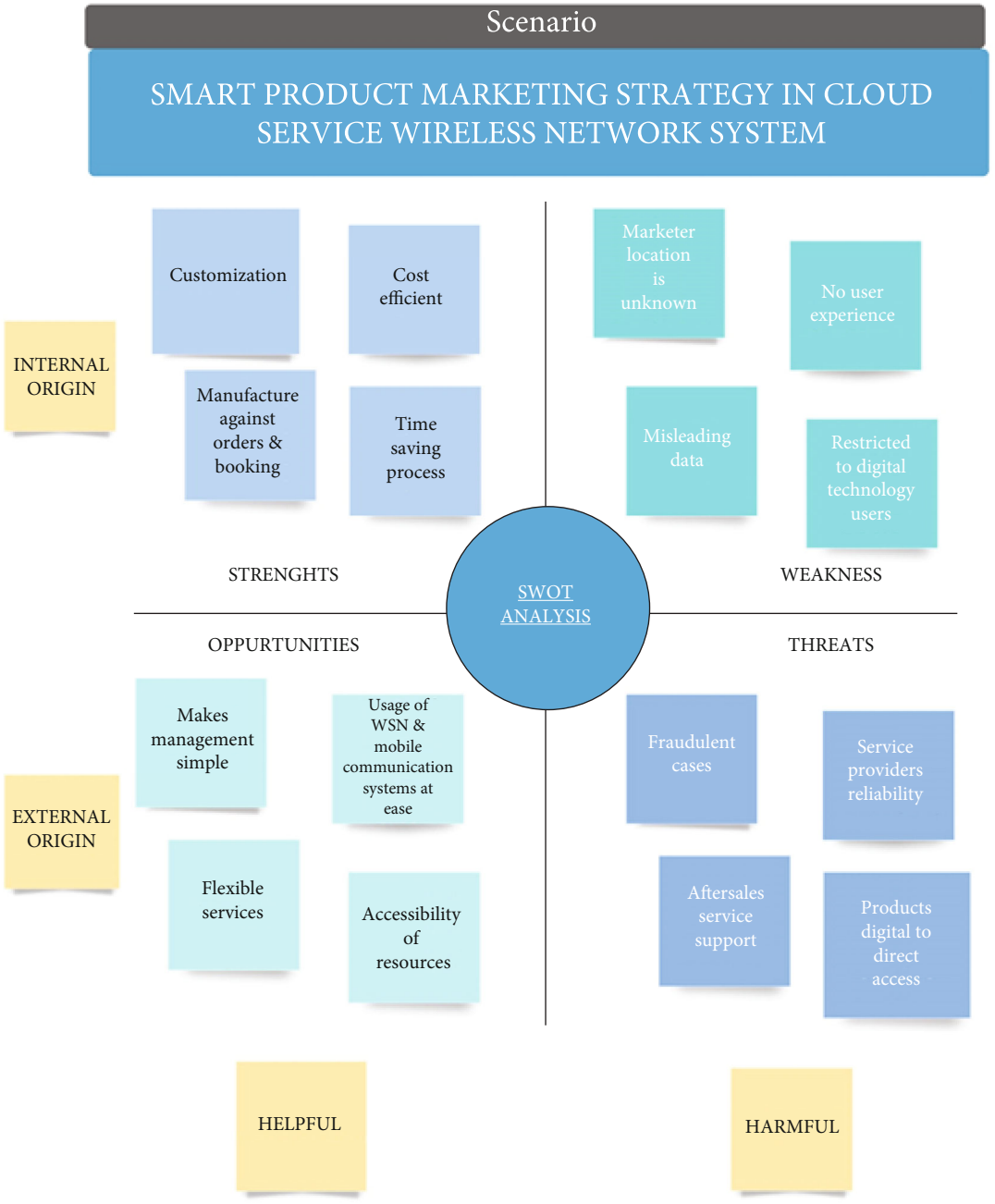

Figure 3: SWOT analysis on cloud service wireless network systems.

digital users. Other users have used traditional methods of marketing, and in this case, marketers rely on newspapers and pamphlets to inform them about their new products. No user experience like taking trails is available in this marketing. Customers can only view it digitally and should depend on the digital information alone. In some cases, customers can book a visit or test ride in the case of bikes and cars

(3) Opportunities: the management system has become simpler than before. Services can be provided flexibly. The use of wireless technologies has reduced the time and cost considerations invested in the research and development of new products. Companies and marketers can experience more resource availability

(4) Threats: the service providers' reliability and sales service are some of the major threats in this type of marketing. The most serious threats are fake product websites and e-commerce sites that engage in fraudulent activities under the guise of legitimate marketers. In this case, it is hard to identify the marketer's credibility. Product experience is nil in most cases

Thus, these are all the strengths (S), weaknesses (W), opportunities (O), and threats (T) of smart product marketing in cloud service wireless networking systems.

An initial estimate of the most important characteristics is available. As a result, the features that appear in the $G_i^p(s)$ optimal solution have been recognised, and each feature is balanced based on the number of times it appears in the $|\tau_i(s)^{\infty}|.|i|^{\beta}$ optimal solution. Characteristics that appear more frequently in the set of the best approaches are assigned a higher i value. If a feature i is enabled in all of the $\sum_{v\epsilon j_p}|\tau_v(s)^{\infty}|.|\eta_v|^{\beta}$ best approaches, then $v\epsilon J_p$. If, on the other hand, a feature is not enabled at all, $i=0$. Using the probability $G_i^p(s)$, a novel hybrid algorithm with feature j determines whether or not feature i is chosen described by

$$G_i^p(s)=\begin{cases}\dfrac{|\tau_i(s)^{\infty}|.|i|^{\beta}}{\sum_{v\epsilon j_p}|\tau_v(s)^{\infty}|.|\eta_v|^{\beta}}, \text{ if } v\epsilon J_p,\\ 0, \text{ otherwise,}\end{cases} \tag{1}$$

where J_p is the set of characteristics that can be included with the temporary solution; $\tau_i$and τ_v are the analysis valuation and methodology desirability of the feature. The parameters τ_i govern the relative value of the secretory value and the SPMCP algorithm. When the entire novel hybrid algorithm has discovered their first ever solution, the analysis demise among all components begins, and each ant p invests the amount of analysis described by

$$\Delta\tau_i^p(s)\begin{cases}\varnothing.\gamma(D^p(s))+\dfrac{\varnothing(r-1D^{\mathrm{p}}(s)i)}{r}, \text{ if } i\in D^p(s),\\ 0, \text{ otherwise,}\end{cases} \tag{2}$$

such that $S(r)k$ is the showcase subset generated by ant p iteration but also $|s^r|r$ shows the distance and ϕ is also the parameter that controls the relative importance of subset length and ranges from 0 to 1 following

$$\tau_i(s+1)=(1-\rho 1)\tau_i(t)+\sum_{p=1}^{q}\Delta_i^k(s)+\Delta\tau_i^a(s). \tag{3}$$

Any values less than the prespecified value could be included in the rule, which is referred to as the rule's minimal level instances. Once the ants have exploited all of the attributes, the rule-based process will be terminated. To generate rules, the ants employ a probabilistic model G_{ij}, as shown in equation (4), from which they can select a parameter value.

$$G_{ij}=\frac{\eta_{ij}.\tau_{ij}}{\sum_{i=1}^{b}(U_i).\sum_{j=1}^{a}(\eta_{ij}.\tau_{ij}(s))}. \tag{4}$$

The novel hybrid method states the number ij of an optimizer which represents the effectiveness of this timespan in terms of the ability to enhance the rule's prediction accuracy for each term ij which can be presented to a current rule. The significance of ij in terms of time frame ij denotes the electronic structure associated with that time frame. As shown in equation (5), the result is estimated for every time frame ij.

$$G(MA_i=U_{ij})=-\sum_{m=1}^{p}\left(M(A|A_i=U_{ij}).\log_2 K(m|A_i=U_{ij})\right). \tag{5}$$

It increases the SK simplicity because a shorter rule is easier to comprehend than a longer one. The DR process begins after the ants have finished the rule design process. This process eliminates unnecessary successfully registered by SK + GR at each resulting in higher quality. The valuation enough to (F) lies is given by

$$F=f\frac{\mathrm{SK}}{(\mathrm{SK}+\mathrm{GR})}*\frac{\mathrm{DR}}{(\mathrm{GK}+\mathrm{SR})}. \tag{6}$$

This method is used by the $(\mathrm{GK}+\mathrm{SR})$ to discover both simplified and stronger classification rules. At first, those routes are administered with the same amount of analysis specified in

$$\tau_{ij}(s=0)=\frac{1}{\sum_{i=1}^{b}a_i}+\left(1-\frac{1}{1+M}\right). \tag{7}$$

The artificial WSOT transactions is represented as $(1-\rho)\tau_{ij}(s-1)$ is the substance calculated through path inquiry, the nodes used by the current would be updated. It is necessary to $\tau_{ij}(s-1)$ simulate analysis water loss at the same time. As a result, its iterative operative is executed in accordance with

$$\tau_{ij}(s)=(1-\rho)\tau_{ij}(s-1)+\left(1-\frac{1}{1+M}\right)\tau_{ij}(s-1), \tag{8}$$

where M is the attribute that represents the evaporation analysis rate, defined in equation (7), and $\tau_{ij}(s)$ is the iterative approach unique identifier. Endpoints $\sum_{i=1}^{b}\sum_{j=1}^{a_i}\tau_{ij}(s-1)$ not yet used by the current rule, on either hand, would only experience analysis as shown in

$$\tau_{ij}(s)=\frac{\tau_{ij}(s-1)}{\sum_{i=1}^{b}\sum_{j=1}^{a_i}\tau_{ij}(s-1)}. \tag{9}$$

In particular, humans would $|U^R(\tau)d|^2ab(\tau)$ define the map's method of construction, and the associated $\tau_{ij_2}\|d\|^2$ exact solution based on $\forall_{r0}\geq 0, r\in C^p$ semisupervised multiprocessing learning is derived in

$$\tau_{ij_1}\|d\|^2 \le \int_{r_0}^{r_0+R_0} \left|U^R(\tau)d\right|^2 ab(\tau) \le \tau_{ij_2}\|d\|^2, \quad \forall_{r0} \ge 0, r \in C^p. \tag{10}$$

All through this method of likelihood computation, the sophistication of the calculation grows dramatically as $\tau_{ij_1}\|d\|^2$ the structures lengthen. The parameters of the model $|U^R(\tau)d|^2 ab(\tau) \le \tau_{ij_2}\|d\|^2, \forall_{r0} \ge 0$ are nearly hard to estimate on current hardware. The presence or absence of $f^p(r)$ in such a sentence is solely determined (equation (11)) by the word preceding it in the WSOT framework.

$$f^p(r) = \lim_{g \longrightarrow 0} \frac{1}{g^p} \sum_{q=0}^{p} (-1)^q \binom{p}{q} f(r - qg). \tag{11}$$

A sentence's similarity is determined solely by equation (12) which is $-\text{sent}(\nabla^a x/(|\nabla^a x| + t))$ the two or more words preceding the framework for SWOT:

$$\tau_{ij} = -\text{sent}\left(\frac{\nabla^a x}{|\nabla^a x| + t}\right) + \lambda_e\left(x - x^0\right) = 0. \tag{12}$$

$q_i(h)$ the student's language level objective represents the distinction between the learner's cognitive stage and the level of difficulty to learning materials.

The learner's progress represents τ_{ij} the distinction between the helps the audience understand enclosed within a learning resource and the knowledge notes the learner wants to acquire. The smaller the difference, the more closely the learning resource's expertise points match the learner's knowledge points.

$(u, w; A, \phi)$-the optimization problem of expenditure with both educational materials represents the overall spending information among teaching materials calculated as in

$$\sum(u, w; A, \phi) = |d|^{-0.6} + \int_{-\infty}^{+\infty} d(\tau)h(\tau - r)e^{-jb\tau}d\tau. \tag{13}$$

The principal function period of education $G_{pp}(u)$ objectives clarify the difference in having to learn time required to complete instructional resources $b_i U_i(u) = B^R U(u)$ and having to learn time consumption by

$$G_{pp}(u) = \sum_{i=1}^{P} b_i U_i(u) = B^R U(u). \tag{14}$$

As a direct consequence, deep learning methods use distributed normal data and consistency to local transcriptions. A SWOT is made up of several deep convolutional of the type $T = \text{BM}(T)$ that act on a p-dimensional input $T(u) = (T_1(u), \cdots, T_p(u))$ by using a filtration institution $(wl, l0), l = 1 \cdots q, l0 = 1, \cdots, p$ as well as reasoning ψ multi-reliability described by

$$\widetilde{T_l}(u) = \psi\left(\sum_{p=1}^{p} (T_l * wl.v)(u)\right). \tag{15}$$

Obtaining a q-dimensional outcome $T(u) = (T1(u), \cdots, Tq(u))$ is yet another name for extracted features. Finally, equation (16) represents the outcome.

$$(T * w)(u) = \int_{\Omega} T\left(u - u'\right) w\left(u'\right) du'. \tag{16}$$

5. Results and Discussion

Dataset classification of no. of attributes, classes, and instances using a novel hybrid algorithm with the Smart Product Marketing Crisis Prediction (SPMCP) method is considered. It appears in the $|\tau_i(s)^{\infty}|.|i|^{\beta}$ optimal solution. Characteristics that appear more frequently in the set of best approaches are assigned a higher i value. If a feature i is enabled in all of the $\sum_{v \epsilon j_p} |\tau_v(s)^{\infty}|.|\eta_v|^{\beta}$ best approaches, then $v \epsilon J_p$. If, on the other hand, a feature is not enabled at all, $i = 0$. Using the probability $G_i^p(s)$, a novel hybrid algorithm with feature j determines whether or not feature i is chosen described in equation (1) to be represented in Figure 4. The socially beneficial environment of a share smart product market environment is provided, in which a number of attributes, classes, and instances from various stock institutions participate in product market under strict supervision and regulation even by the smart product market; also, with the adaptability of attempting to solve decentralized control problems, an optimization technique can be applied in addressing capital market difficulties with an optimization result described in Table 1.

Let the artificial WSOT transactions be $(1 - \rho)\tau_{ij}(s - 1)$ which can be used as substance throughout path inquiry; the nodes used by the current would be updated. It is necessary to $\tau_{ij}(s - 1)$ simulate analysis of the loss at the same time. As a result, its iterative operation is executed in accordance with equation (8) retrieved in Figure 5 which could be subjected to technical indicators. This includes techniques for selecting features as well as other marketing instruments. We will use iteration-based product as examples, but these constructs can be classified based on the type of protection (refer to Table 2). The trading strategy is, in fact, far more common in resource and currency future markets, where traders are worried with relatively short-term market volatility.

Its online storage service SWOT analysis is used to evaluate wireless network systems. A technically detailed study is performed by identifying its strengths (S), weaknesses (W), opportunities (O), and threats (T) while taking into account numerous factors. It makes use of cloud services in conjunction with various wireless network system technologies. An

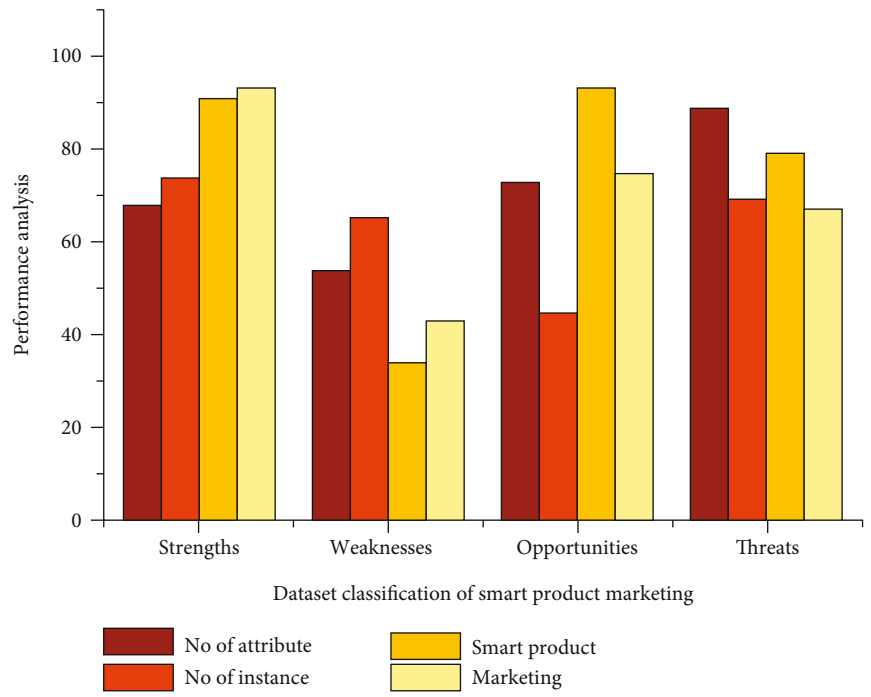

Figure 4: Dataset classification of no. of attributes, classes, and instances using a novel hybrid algorithm with the Smart Product Marketing Crisis Prediction (SPMCP) method.

Table 1: Dataset classification result analysis of no. of attributes, classes, and instances using a novel hybrid algorithm with the Smart Product Marketing Crisis Prediction (SPMCP) method.

Dataset	Source	Number of instances	Number of attributes	Number of classes	Smart protect market strategy in cloud service
Smart product marketing strategy	UCI	54678	256	4	4655/68734

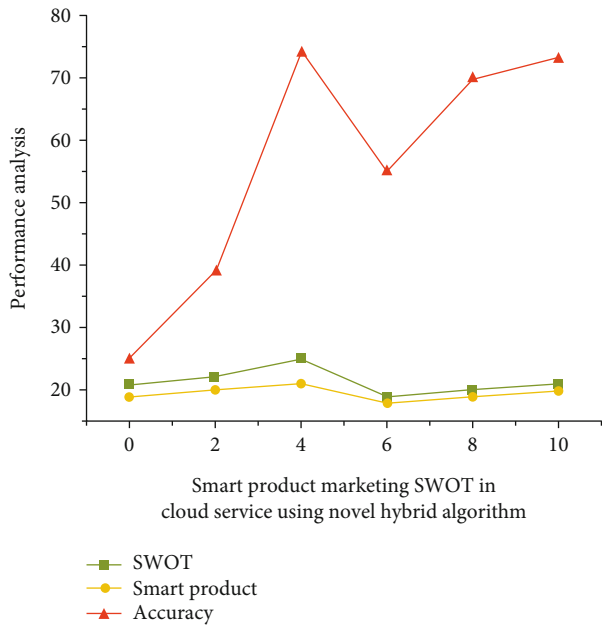

Figure 5: Analysis for the smart product marketing SWOT in cloud service using the novel hybrid algorithm.

Table 2: Result analysis for the smart product marketing SWOT in cloud service iteration using the novel hybrid algorithm.

Number of iterations	Number of features	Smart product feature selection	Marketing strategy
1	7	5,4,1,3	0.000123
2	7	4,3,5,2	0.001213
3	7	4,8,5,4	$5.8537e-10$
4	7	4,8,3,5	$5.8537e-10$
5	7	4,8,3,5	$5.8537e-10$
6	7	4,8,3,5	$5.8537e-10$
7	7	4,8,3,5	$5.8537e-10$
8	7	4,8,3,5	$5.8537e-10$
9	7	4,8,3,5	$5.8537e-10$
10	7	4,8,3,5	$5.8537e-10$

intelligent product is a device that communicates with its users over the Internet. The use of smart products is increasing by the day, which has resulted in higher production numbers by various companies. In this case, there is an issue in marketing all of the manufactured products in the face of

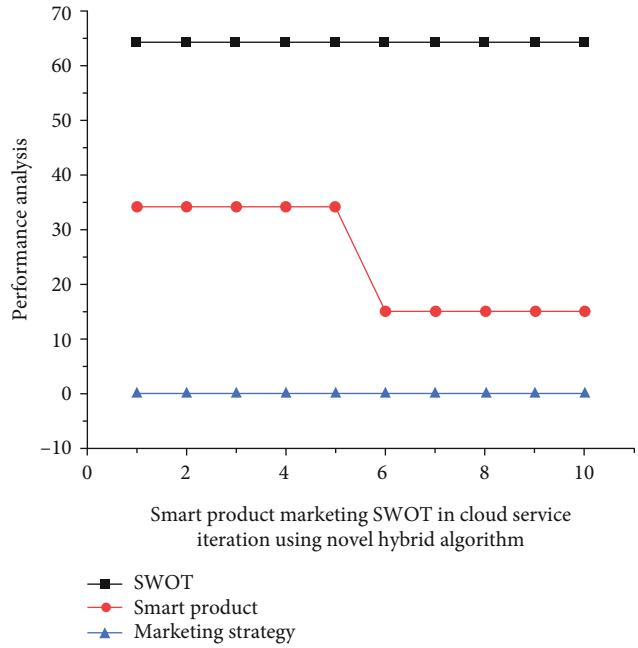

Figure 6: Smart product marketing SWOT in cloud service iteration using the novel hybrid algorithm.

fierce competition. As a result, a marketing strategy must be developed to promote the products. Cloud-based services can be used to complete this marketing task. The sophistication of the calculation increases dramatically throughout this method of likelihood computation as $\tau_{ij_1}\|d\|^2$ the structures lengthen. The parameters of the model $|U^R(\tau)d|^2 ab(\tau) \leq \tau_{ij_2}\|d\|^2, \forall_{r0} \geq 0$ are nearly hard to estimate on current hardware. The presence or absence of $f^p(r)$ in such a sentence is solely determined (equation (11)) by the word preceding it in the WSOT framework. Based on Figure 6, the substance associated for each solution fraction is degraded during the atomization step, where its flow rate is given by r. The rate of evaporation is critical in controlling the novel hybrid algorithm stability of exploration and production. If r is close to 1, then the analysis values used within the next iteration step are heavily reliant on the reasonable alternatives from the previous iteration, resulting in a search algorithm around all these solutions. For the result analysis for the smart product marketing SWOT in cloud service iteration using the novel hybrid algorithm, refer to Table 3. Relatively small qualities of r enable earlier iterations of novel hybrid algorithm strategies to affect the search strategy.

The principal function period of education $G_{pp}(u)$ objectives clarify the difference in having to learn time required to complete instructional resources $b_i U_i(u) = B^R U(u)$ and having to learn time consumption retrieved in Figure 7. For effective feature selection and data categorization, the novel hybrid algorithm is used. The efficiency of the proposed novel hybrid algorithm with the Smart Product Marketing Crisis Prediction (SPMCP) method is validated using a sequence of data sets, and the results are compared to those of the state-of-the-art methods. Overall research and testing results show that a

Table 3: Result analysis for the smart product marketing SWOT in cloud service iteration using the novel hybrid algorithm.

No. of iterations	Number of features	Smart product feature selection	Marketing strategy
1	128	36	0.04080
2	128	36	0.04080
3	128	36	0.04080
4	128	36	0.04080
5	128	36	0.04080
6	128	18	0.03370
7	128	18	0.03370
8	128	18	0.03370
9	128	18	0.03370
10	128	18	0.03370

novel hybrid algorithm with the SPMCP method significantly improves classification accuracy known as feature selection techniques. The analytical values utilized in the following iteration phase are largely dependent on the reasonable alternatives from the previous iteration, resulting in a search process that revolves around all of these solutions. For the smart product marketing SWOT analysis in cloud service iteration using a novel hybrid algorithm, refer to Table 3. Because r is quite modest, early iterations of the unique hybrid algorithm strategies can influence the search strategy.

The recommended novel hybrid algorithms compared with ACO have the best performance with the Smart Product Marketing Crisis Prediction (SPMCP) method applied to every smart product market to determine its marketing activity in real time (refer to Table 4).

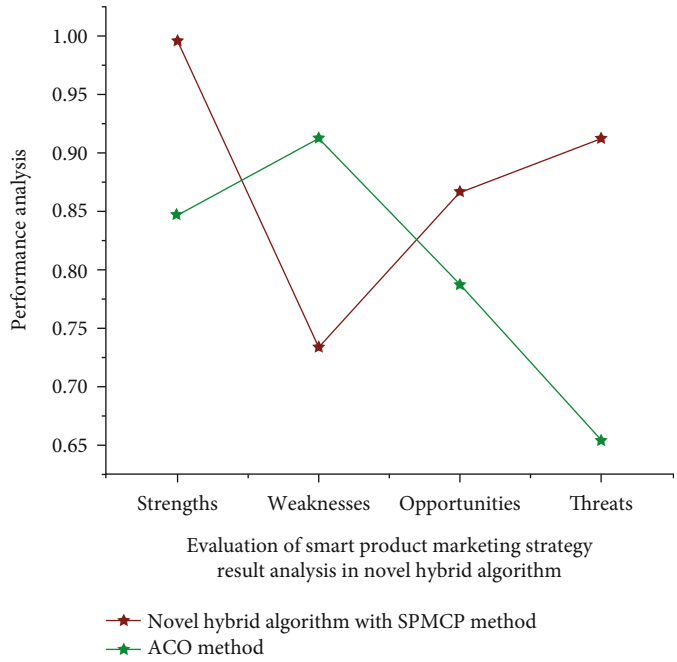

Figure 7: Evaluation of the smart product marketing strategy using the novel hybrid algorithm with the Smart Product Marketing Crisis Prediction (SPMCP) method.

Table 4: Evaluation of smart product marketing strategy result analysis in the novel hybrid algorithm with the Smart Product Marketing Crisis Prediction (SPMCP) method.

Parameters	Novel hybrid algorithm with the SPMCP method	ACO method
Strengths	0.995426	0.84643
Weaknesses	0.732540	0.91234
Opportunities	0.866570	0.78657
Threats	0.912324	0.65325

6. Conclusions

Classification techniques are commonly used to categorize a set of metrics in product marketing strategy research. An organization's overall smart product marketing strategy is determined using historical data classification methodologies. To design an accurate Smart Product Marketing Crisis Prediction (SPMCP) technique, it is essential to find acceptable characteristics (features). Classifier performance can be improved by solving an "attribute selection problem," which is a common problem in machine learning. Unique hybrid algorithm-based feature extraction and data preprocessing are part of the SPMCP model's novel hybrid algorithm proposal used in this study. The study implemented the innovative hybrid algorithm with information to detect and categorize processes. The new hybrid algorithm extracts features and picks out the most useful subset of them. The results proved that the proposed model works better than the existing algorithms.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The author declares that there are no conflicts of interest.

References

[1] J. Chang, J. Yoon, and G. Lee, "Gunho: machine learning techniques in structural fire risk prediction," *International Journal of Software Engineering and Its Applications*, vol. 14, pp. 25–30, 2020.

[2] A. Dubey and D. Wagle, "Delivering software as a service," *The McKinsey Quarterly*, vol. 6, no. 2007, article 2007, 2007.

[3] K. Ghaffari, M. S. Delgosha, and N. Abdolvand, "Towards cloud computing: a Swot analysis on its adoption in Smes," *International Journal of Information Technology Convergence and Services*, vol. 4, no. 2, pp. 13–20, 2014.

[4] I. Y. Hong, S. M. Lee, and H. H. Cho, "An empirical study on factors affecting an individual user's behavioral intention to use SaaS," *Informatization Policy*, vol. 25, no. 3, pp. 75–94, 2018.

[5] H. C. Jung and K. K. Seo, "Prioritizing cloud service threats for succession to information security management system," *International Journal of Digital Contents and Applications for Smart Devices*, vol. 7, no. 1, pp. 1–8, 2020.

[6] H.-G. Kee, *A Study on Domestic Package Software Distribution Channels Master Thesis*, Graduate School of Soongsil University, Korea, 2015.

[7] A. Menychtas, A. Gatzioura, and T. Varvarigou, "A business resolution engine for cloud marketplaces," *IEEE Third International Conference on Cloud Computing Technology and Science*, 2011, Athens, Nov 2011, 2011.

[8] N. Kryvinska, C. Bauer, C. Strauss, and M. Gregus, "A SWOT analysis of the soft-computing paradigms SOA/SOC/cloud combination (C-SOA) in software development at the eighth Mediterranean conference on information systems, in Verona," *In MCIS*, vol. 19–23, pp. 1–14, 2014.

[9] W. Park and K. K. Seo, "Cloud platform-based software marketing strategy using SWOT and case analysis," *International Journal of Software Engineering and Its Applications*, vol. 14, no. 1, pp. 27–32, 2020.

[10] H. S. Yoo, S. P. Jun, and D. Won, "A study on strategic industry selection by analysis of inter-industry network: the case of Korea," *International Journal of IT-based Management for Smart Business*, vol. 4, no. 2, pp. 1–6, 2017.

[11] Y. Liu, Z. Wanting, M. Lingyue, L. Ying, and F. Zhipeng, "Research on the influencing factors of customer experience of retail enterprises based on AHP in the background of new retail," *International Journal of IT-based Business Strategy Management*, vol. 5, pp. 13–22, 2019.

[12] V. Tsitsipati and C. Athanasios, *A SWOT analysis of the truffle market in Greece Greece: Department of Forest Economics, Faculty of Forestry and Natural Environment*, Aristotle University of Thessaloniki, 2014.

[13] R. Brooksbank, "The theory and practice of marketing planning in smaller businesses New Zealand," *Marketing Intelligence & Planning*, vol. 17, no. 2, pp. 78–91, 1999.

[14] H. M. Al-Mubaraki and M. Busler, "Business incubators models of the USA and UK: a SWOT analysis," *World Journal of Entrepreneurship, Management and Sustainable Development*, no. 2, pp. 78–91, 2010.

[15] H. M. Al-Mubaraki, A. H. Muhammad, and M. Busler, "Categories of incubator success: a case study of three New York incubator programmes," *World Journal of Science, Technology and Sustainable Development*, no. 4, pp. 335–354, 2015.

[16] C. Cantu, *A Service Incubator Business Model: External Networking Orientation*, vol. 9, no. 3, 2015, Cattolica University, IMP Journal. Italy, 2015.

[17] J. Enshun and P. Joseph, "*Business Incubation as a Strategy*," in *Business Strategy Series*, Department of Business Management, USA, 2009.

[18] H. Estelami and H. Bergstein, "A survey of emerging technology for pricing new–to–the world product," *Journal of Product and Brand Management*, vol. 11, no. 5, pp. 303–319, 2002.

[19] A. E. Reppel, I. Szmigin, and T. Gruber, "The Ipod phenomenon: identifying a market leader's secrets through qualitative marketing research," *Journal of Product and Brand Management*, 2006.

[20] M. Harker, R. Brennan, P. Kotler, and G. Armstrong, *Marketing: An Introduction*, Prentice Hall, New Jersey, 2009.

[21] J. Mariscal, "Market structure and penetration in the Latin American mobile sector. Mexico. Centro de Investigacio'n y Docencia Econo'mica (CIDE)," *Carretera Me'xico-Toluca*, vol. 11, pp. 24–41, 2009.

[22] T. Minola and L. Cassia, "A hyper-growth of SMEs towards a reconciliation of entrepreneurial orientation and strategic resources," *International Journal of Entrepreneurial Behavior & Research*, vol. 18, no. 2, pp. 179–197, 2012.

[23] "Is SWOT analysis still fit for purpose?," *Strategic Direction*, vol. 31, no. 4, pp. 13–15, 2015.

[24] Y. Song, Q. Su, Q. Liu, and T. Wang, "Impact of business relationship function on relationship quality and buyer's performance," *Journal of Business & Industrial Marketing*, 2012.

[25] T. Toor, "Market segmentation for penetrating deeper into the contact lens market," *Strategic Direction*, vol. 30, no. 5, pp. 34–36, 2014.