A WEB-BASED APPLICATION FOR MAKING LOW-COST VACATION RESERVATIONS FOR TOURISTS USING THE K-NEAREST NEIGHBORS ALGORITHM

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ABSTRACT:

An occasional recreational vacation is a necessity for many people. It provides a perfect opportunity for the body and the mind to get much-needed rest after weeks, months, or years of daunting tasks and a break from routine. It also gives people morale as they perform their usual tasks afterward. Unfortunately, many people are unable to afford a vacation not only internationally but also locally due to the high costs involved. This makes many people prefer spending their holidays with extended families, by, for instance, traveling to their rural homes as opposed to taking a vacation. To boost the tourism sector in our country that is being promoted by initiatives such as 'Tembea Kenya', we should encourage domestic tourism. Another challenge is the experience in hotels that some people do not like that would entirely cause them to opt to spend their holidays differently, for example, the lack of privacy in the shared accommodation facility, the limited space in hotels, the numerous restrictions, the level of cleanliness in the shared facility especially during the COVID-19 crisis, etcetera. The aim of this project was to solve the problem by coming up with a technological means of enabling people to make reservations for vacation homes with each other such that they mutually benefit from the program thus eliminating the fee for renting out the house. This solution was implemented using a web-based application and applied the K-Nearest Neighbors machine learning algorithm that was used to classify homes based on the features available.

1. INTRODUCTION

1.1 Background

To fully enjoy work, one must embrace the times when they are not at work and give their minds and bodies a chance to relax, recharge, and rejuvenate (Tonkins, 2022). One of the ways to accomplish this is by taking a recreational trip to new places with friends and/or family to make the holiday much more interesting and fuller of memories.

For many around the world and particularly in Kenya, this kind of vacation is not feasible because of the costs which include but are not limited to, accommodation costs at the holiday destinations, traveling costs which include passport and visa applications for international trips, and the entrance fees at the tourist attraction sites. The costs are also highly dictated by demand which is dependent on the season. Seasons are categorized as low, green, and high/peak, with each associated with different expectations and demands. They result in variation in tourists' arrivals both domestic and foreign to destinations ranging from beaches, safaris, and parks, just to mention but a few (Wawira, 2016). For this reason, most people choose to stay at home, have a day out with family, or visit their extended families during the holiday periods.

This situation has led to the country's overreliance on foreign tourism for many years to the extent that the sector was hardly hit by the COVID-19 pandemic when the country was locked down and no tourists from abroad would come to Kenya. This has made the government to increase its efforts in promoting domestic tourism through campaigns such as the 'Tembea Kenya' initiative in the recent past. According to Bloomberg Terminal Research (2017), domestic tourism has been gaining momentum with the Kenya Tourism Board launching marketing campaigns aimed at attracting Kenyans to take up domestic tourism. They further state that while Kenyans have limited purchasing power, campaigns urging tour operators and hotels to reduce rates for the domestic traveler to encourage them to take up holidays during the low season is paying dividends.

In addition to that, some of the people who can afford hotel vacations still opt not to spend their holidays like that because they do not get a good and memorable experience with their loved ones. Every time they start planning their vacation, they find themselves worrying about issues like their kids' safety or where they will take their pets since most of the facilities do not allow accompanying pets.

1.2 Problem Statement

(Manwa & Mmereki, 2008) state that in the African marketing strategies, the development of domestic tourism has received little attention as it is assumed that most African citizens live below the poverty line and hence cannot afford to go on a holiday. People end up having their routine activities during the holidays which brings about little or no rejuvenation and deprived mental well-being. Some psychologists tout the mental benefits of vacationing somewhere new. According to Crowne (2013) 485 adults in the U.S. linked travel to enhanced empathy, attention, energy, and focus. Other research

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suggests that the act of adapting to foreign cultures may also facilitate creativity (Curran, 2020).

When booking hotel accommodation, guests usually cannot pick the exact location or receive all the amenities they need as is with the case of vacation rentals. For the best value for money, one needs a place with more flexibility, facilities, space, and privacy during the vacation with friends and/or family. This will give a better experience that cannot be easily gotten from hotel facilities, especially during peak seasons.

1.3 Aim

The aim is to develop a web-based application for making low-cost vacation reservations for tourists.

1.4 Specific Objectives

i. To evaluate the challenges faced by tourists in planning for vacations.
ii. To review existing systems.
iii. To design and develop a web-based application that enables customers to make low-cost vacation trip reservations.
iv. To test and validate the proposed solution.

1.5 Justification

Many people find trips to holiday destinations quite expensive and end up abandoning the idea altogether, especially with the COVID-19 pandemic which has caused a huge disruption in the aviation and hospitality industries. The proposed solution will benefit a large group of people because the users will swap their homes which in turn will highly reduce or eliminate the cost of accommodation since each party benefits from each other's house and facilities.

For others, the experience of having a vacation in hotels and resorts is one they would not like to have as they would in a rented-out holiday home. This has seen the demand for holiday rentals on the rise in the recent past. Travel Weekly's research confirmed this growth in the vacation rentals market, from 8% of travelers in 2010 to 22% in 2014 (Chipkin, 2015). Most of the forecasts agree that the vacation rental market will continue to boom in 2016 and 2017 (CroJetSet, 2019). The proposed solution will facilitate the exchange of houses which will be holiday homes in the agreed-upon period offering a better experience to tourists and making the holiday more enjoyable.

1.6 Scope and Limitations

1.6.1 Scope: The solution will be implemented as a web application since its use by a user is not so frequent for its need on a mobile phone. It will also be limited to Kenya in terms of operation.

1.6.2 Limitation: The solution will only take care of local vacations. This is because local tourism in the sector has been majorly affected by the costs involved making the locals resort to other ways of spending their holidays.

2. LITERATURE REVIEW

2.1 The challenges faced by many people concerning vacation planning

2.1.1 High cost of accommodation facilities: The most common places for tourists' stay in holiday destinations are accommodation facilities such as hotels, resorts, lodges, and inns. These facilities are quite expensive due to the services offered, tax requirements, the location, and most especially the demand during high peak seasons when most people opt to take their vacations. According to Wawira (2016), the highest season (usually during the festive period like December for most regions), attracts more tourists than other seasons, and its recurrence has resulted in perpetual trends in the hotel industry. These costs are bound to rise further given the COVID-19 crisis that has hit the hospitality industry in the past couple of months. According to Kiesnoski (2021), nightly rates, while still somewhat lower than a year ago, are slowly rising to match or in some popular destinations surpass pre-pandemic prices, according to travel booking technology company Koddi. This situation discourages many from having such kinds of holidays resorting to staying at home with family or visiting their extended families.

2.1.2 High costs of traveling for international vacations: For those who plan for a vacation in a different country, the cost of air travel is also significantly high. This cost includes passport and visa, travel insurance, and flight ticket cost. With the COVID-19 crisis that led to many countries being locked down, the airline fleets were not used and now that countries are opening, the demand is shooting up leading to an increase in air ticket prices. (Josephs, 2021) states that airfares and hotel rates are climbing as travelers return in the highest numbers since the pandemic began, hitting beaches, mountains, and visiting friends and family after a year of being cooped up.

2.1.3 The lack of an enjoyable family experience for some people from accommodation facilities: For some people staying in an accommodation facility with family does not give the best experience. This is because there is a limitation in space, facilities, privacy, and flexibility. Apart from their favorable costs, vacation rentals offer the little extra things that most shared facilities do not make it a better-preferred option. This is evident with the rising demand for vacation rentals in the recent past. According to Perkins (2020), another big financial advantage to vacation rentals is that they typically include full-size, working kitchens where you can prepare as many meals as you want at far below restaurant costs. Vacation rentals are nothing new, but the convenience and efficiency of the short-term rental model via online platforms like Airbnb, HomeAway, and Vrbo are attracting droves of investors and customers (Rastegar, 2019).

2.1.4 Concerns over cleanliness and safety due to the COVID-19 pandemic: With the pandemic, travelers are paying greater attention to cleanliness and hygiene while making their bookings since there is a risk of the spread of the virus in shared facilities such as hotels. According to O'Toole (2020), this trend will likely increase, as travel once again increases in the wake of the COVID-19 crisis, since guests will be looking for signs of cleanliness as a proxy for safety and renewed trust in hotel brands. However, this has seen an increased preference for vacation homes due to their privacy and self-contained nature.

2.2 Existing systems

There exist related works that aim at solving the same problem. These systems which have slight differences in terms of their concepts and functionalities have already been deployed for public use. Examples of such systems include Airbnb, Destination Xchange, and Home Exchange.

2.2.1 Airbnb: Airbnb which began in 2008 is an online community where listing and renting of homes is done. Now, millions of hosts and travelers choose to create a free Airbnb account so they can list their space and book unique accommodations anywhere in the world (Airbnb, 2022). Once a reservation is done the travelers share the private property with the hosts for the number of nights agreed upon. However, given that the service is bed and breakfast, the traveler is offered the room and breakfast only in the package. This is suitable for people who have a busy schedule and would only require a room for the nights and breakfast before getting to the schedule. It can be used by people on vacation or even people on official trips. The charges are done per night and are paid to the hosts who will pay Airbnb a commission for facilitating the whole process. This solution has helped reduce the accommodation costs at the travel destination as well as making it convenient for the travelers to stay nearer their destination.

There are some drawbacks to the use of Airbnb both to the hosts and the guests. The hosts have no familiarity with the guests therefore there is a chance that they might host unpleasant guests in their home. On the guests' side, there is a lack of privacy if the reservation is done for rooms in a home that is still being occupied by the hosts in the given period. The hosts might also have lower standards of cleanliness and orderliness compared to the guests. A guest may book a home expecting to have a quiet weekend, only to find that the hosts are noisy (Goodman, 2018).

2.2.2 Destination Xchange: Destination Xchange is a platform that facilitates a home exchange program in a variety of vacation destinations. If a home is in a higher tier, it means that it has very good facilities, a large space, and is in a good location and vice versa for lower-tier homes. One of the greatest features of Destination Xchange is that you are not restricted to solely being able to reserve weeks in the same tier as your own. If you choose, you can reserve accommodations in a higher tier by paying an upgrade fee in addition to the standard exchange fee (Destination Exchange Program Booklet, 2016). This solution has helped reduce the costs further by excluding the host's fee. This is because the parties mutually exchange their homes which are used as vacation homes in the agreed period.

The drawbacks of the system include one party finding the vacation home in a poorly maintained condition making the stay in that house unbearable and a possibility of one of the parties being malicious resulting in theft or damage of property in their vacation home.

2.2.3 Home Exchange: Home Exchange is a large online community where people list their homes on the platform and send exchange requests to members in their respective travel destinations. Home Exchange has different kinds of exchanges, 'The Classical Exchange' where two families exchange their homes either simultaneously or at different times, and 'Exchange with GuestPoints' where if a member wants to reserve a home but the other member does not want to come to the member's home in return, the other member has an option of staying in another available home using accumulated GuestPoints (Home Exchange, 2022). Instead of having a currency-based transaction, the GuestPoints act as payment from the requester since the other party does not want to stay in his/her home. Like other home swap solutions, this system has helped in drastically reducing the cost of a holiday home since the owners mutually exchange their homes in the agreed period. However, it has made it easier for people who want to exchange locations that are not corresponding.

Similarly, like other solutions, one party may find the house in a poorly maintained condition making the stay in the house uncomfortable or a party may be malicious or negligent at the expense of the other homeowner.

2.3 General gaps in the existing works

Though the above existing works are trying to solve the same problem, they have gaps that make them not as efficient as required by the people they are serving. Some of them do not have an optimized search that makes it easy for one to get the best matches for them given the vacation details provided making the home search in the holiday destination a tedious process. Other solutions implement monetary compensation in situations where there is an exchange between homes that do not match in terms of value and where there is a one-sided reservation. This together with other costs involved such as tax and the platform service fee end up making the overall cost relatively high.

2.4 Conceptual Framework

Figure 1 below shows a framework of how the system works. The transactions that occur between the different users of the system are shown.
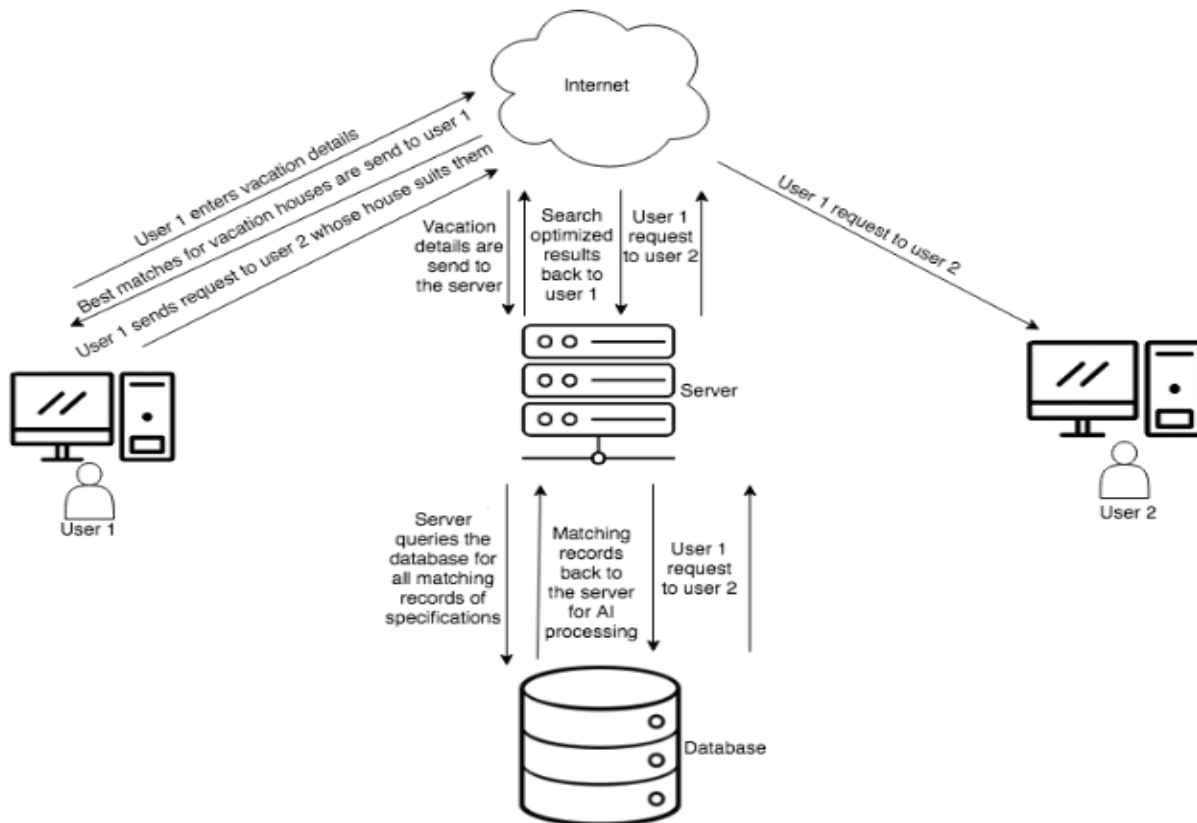
Figure 1. Conceptual Framework

3. SYSTEM DEVELOPMENT METHODOLOGY

The iterative model of the agile methodology was used in the development of the application. This means that modules in the platform were constantly modified overtime where needed to achieve more efficiency of the platform. The model would allow for easy adaptation of the application to the changing needs of the clients and the project itself. The urgency or risk associated with a project may change. The approach provides a time and space for urgency and risk recognition and alleviation in the early stages of the process (Z-Stream, 2019).

In the planning and requirements stage, the requirements gathering process was done using the study of analogous systems such as Airbnb, Vrbo, Home Exchange, and Destination Xchange since they contain working versions of the solutions to problems.

A deep analysis of those systems was done for the purpose of designing the platform both physically and logically. The system applied the OOAD (Object-Oriented Analysis and Design) approach and for that purpose, the use case diagram, the ERD (Entity Relation Diagram), and the sequence diagram were the analysis tools whereas the class diagram and database schema were used as the design tools. This approach allowed objects to interact to achieve the goals. Given that the entities of the system have similar traits, the reuse of objects was necessary to make the system more efficient and reduced the development time.
For the implementation stage, all the project tools and techniques which include the various programming languages, Orange Data mining Software, K-Nearest Neighbors Algorithm were used in the development of the system.

After implementation and deployment, testing was done to ascertain that there were no bugs that were existing in the application. This was done using PHP Unit, a testing tool.
Finally, evaluation was done as the final step in the cycle to determine if the application met the requirements and if it solved the problem.

4. THE HOME SWAP WEB-BASED APPLICATION

4.1 System design
The system was designed with the following requirements in place for end-users to accomplish their tasks:

- The system should allow for user registration and authentication that will give a personalized experience to the users.
- The system should do home classification using AI once a registered user adds a home.
- The system should provide a user-friendly searching mechanism for vacation homes.
- The system should allow users to request home swaps.
- The system should do reporting on the administrator's portal for evaluation of various insights that help in decision making.
- The system should accommodate exchange point renewal for users who are exchanging homes that are in different tiers.

The system sequence diagrams below represent 2 customer processes, making reservations for home exchange and responding to home exchange requests. They describe the customer journey from the start when the customers log in through the various processes to the end when they log out.
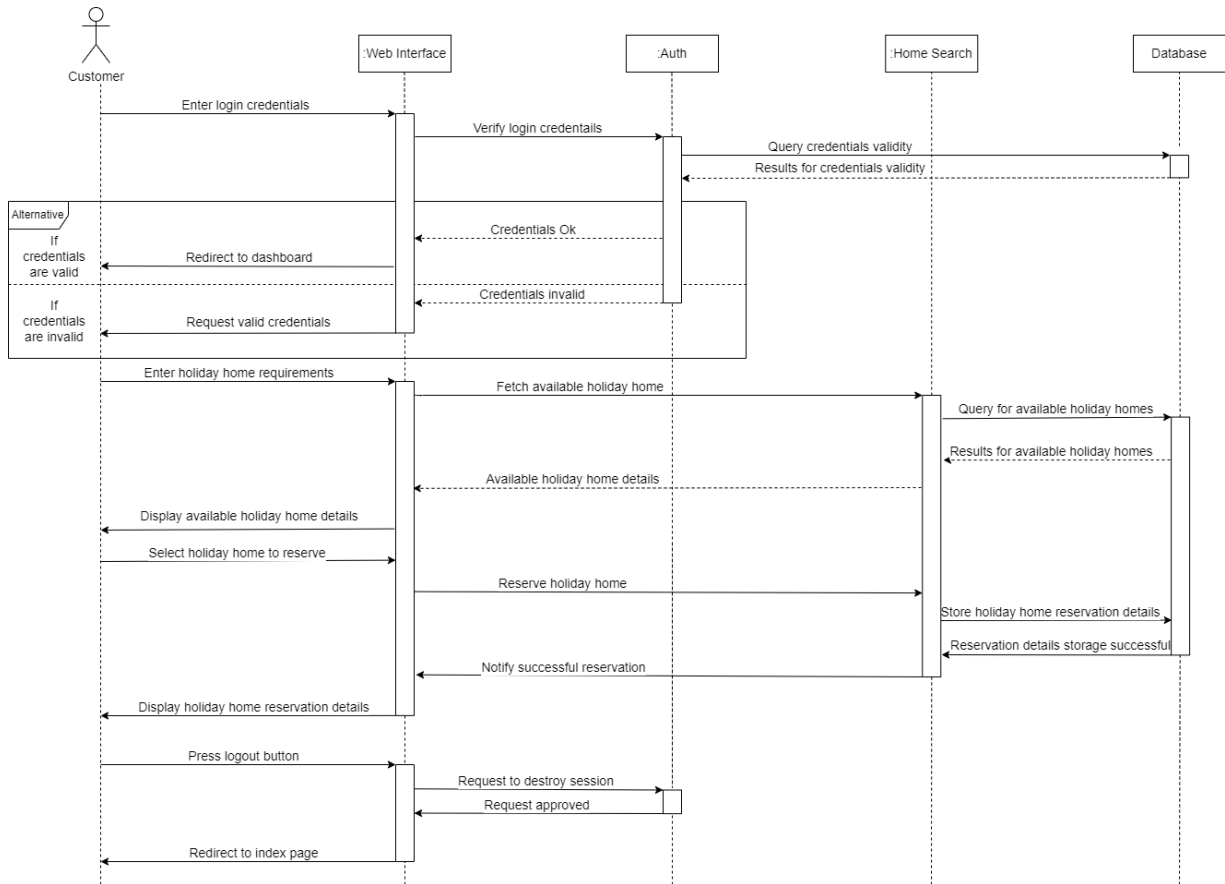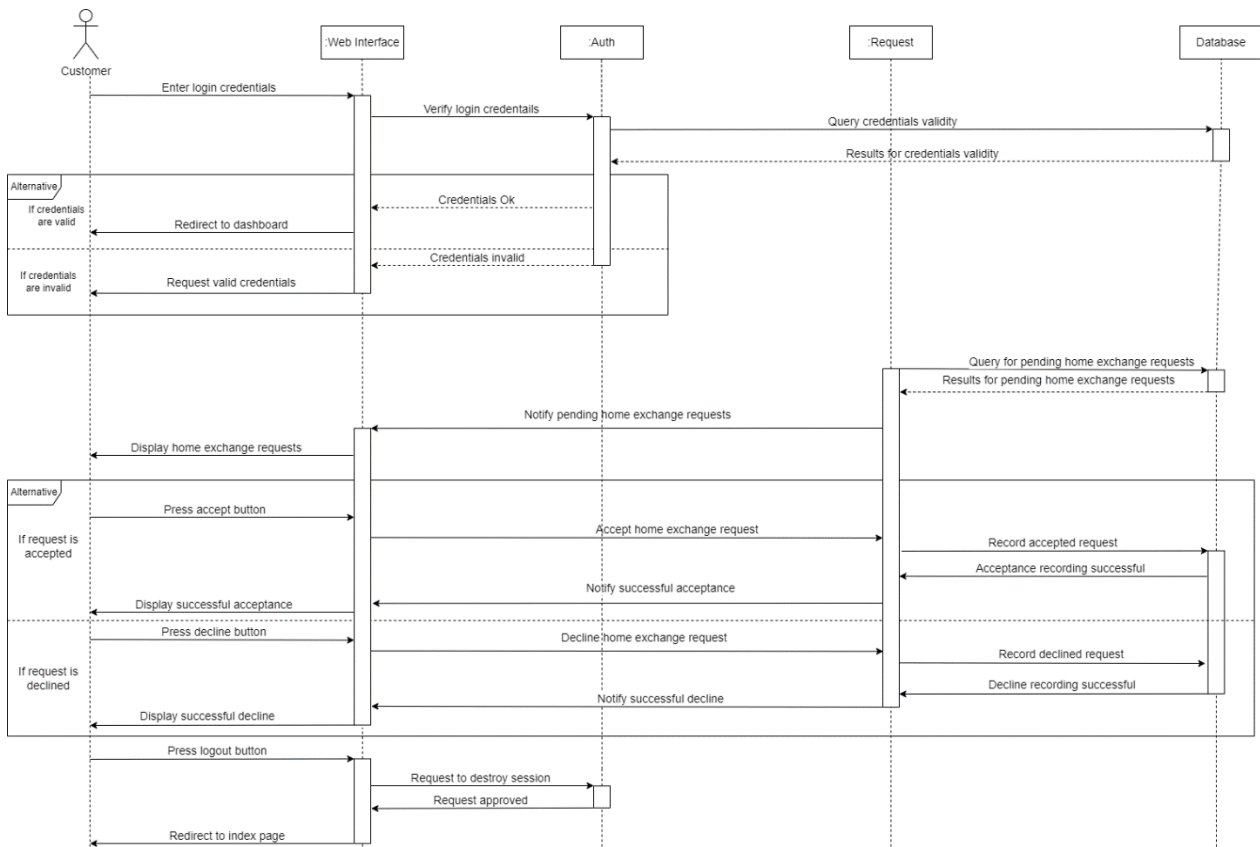
Figure 2. Search and request process sequence diagram

Figure 3. Home Exchange request reception and response sequence diagram

4.2 System Implementation

The various tools were used in developing the system in a modularized approach. The machine learning module that used the K-Nearest Neighbors algorithm for home tier classification was the first to be developed to completion. Airbnb, another existing system that aims to solve the same problem uses the same algorithm in its implementation. One challenge that Airbnb hosts face is determining the optimal nightly rent price for their space. To solve this, Airbnb's algorithm seeks to, find a few listings that are similar to the hosts', average the listed price of the homes that are similar and, suggest a listing price based on the average that has been obtained. Similarity of the homes is based on the various features that the home has such as, the number of bedrooms, the location, the hosts' response rate, among others. We used a similar approach to rank the homes based on features and the only difference came in in what was to be predicted using the machine learning algorithm. While Airbnb uses the criteria to suggest the price of the homes, we used it to rank the homes into tiers given that the listing price and tier ranking are directly proportional.

It was necessary to train the model with datasets that classify homes based on their various features. Datasets such as Airbnb house pricing datasets from repositories such as Kaggle were examined for relevance and accuracy. Given that most of the datasets were for foreign countries, they were not contextual to the Kenyan homes because of the home features used in classification. Given the situation together with a lack of published data on Kenyan homes, the creation of a dataset suitable for Kenya was necessary for the model training process. In the dataset creation process, the various home features that would be used in the home classification process were specified. The specified features used are shown in the table below.

Feature	Possibilities
Swimming pool	True or False
Home type	House or apartment
Residence type	Primary or secondary
Television	True or False
Wi-Fi	True or False
Air Conditioner	True or False
Bedrooms	Number of bedrooms
Bathrooms	Number of bathrooms
Occupancy	Number of occupants
Private Gym	True or False
Parking	True or False
Wheelchair accessibility	True or False
Kids friendliness	True or False
Pets allowed	True or False
Homeworker(s)	True or False
Security guard(s)	True or False
Private Garden	True or False
Smokers allowed	True or False

Table 1. Home feature possible results

The homes would be classified into five tiers with tier one homes having the best features while the subsequent having less. The dataset that would be used in classification was based on a set of rules laid out to determine what homes qualify to be in the various tiers. To make these practical, various features had different levels of superiority to others, and would not be practical to use the number of features a home has because some features would be considered inferior to others. The features classification is shown below.

High-end features	Mid-tier features	Minor features
Swimming pool	House type	Wi-Fi
Private gym	Security guard(s)	Television
Homeworker(s)	Kids friendly	Air conditioner
Private garden	Wheelchair accessibility	Residence type
	Parking	Pets allowed
		Smokers allowed

Table 2. Home classification features

Given that, the classification rules were set in a way such that each tier had minimum requirements for each set of features. The rules are specified below.

Tier	Minimum requirements
1	All high-end features
	Security guard(s), kids friendly + 2 any other mid-tier features
	Wi-Fi, television, air conditioner + 2 any other minor features
2	Private gym, private garden, homeworker(s)
	Security guard(s), kids friendly + 2 any other mid-tier features
	Wi-Fi, television, air conditioner + 2 any other minor features
3	Private garden, homeworker(s)
	Security guard(s), kids friendly + 1 any other mid-tier feature
	Wi-Fi, television + 1 any other minor feature
4	Any 1 high-end feature
	Any 2 mid-tier features
	Wi-Fi + any 1 minor feature
5	No high-end feature
	Any 1 mid-tier feature
	Any 2 minor features

Table 3. Home tier requirements

In the dataset, the presence of a feature in the home was denoted by 1 while absence was denoted by a 0. In the case of home type, houses were represented by 1 while apartments were represented by a 0, and in the case of residence type, primary residence was denoted by 1 while secondary residence was denoted by 0. The figure below shows a screenshot of the representation of the dataset in CSV format.

Figure 4. Home tier classification dataset

The KNN ML model was developed and tested using the Scikit-learn machine learning library in the Jupyter notebook editor. With the help of Orange data mining tool, the dataset was refined since various statistical aspects of the tier classification data were shown. Aspects such as the importance of a feature in each tier, clustering of homes based on their characteristics (features), correlation of features, among others could be obtained from the tool.

After thorough testing and satisfactory results were gotten, the model was saved in a pickle file to avoid retraining of the model each time a request for analysis of a home is done from the platform. This is with the aim of making to process much faster thus enhancing the user experience.

Another crucial part of the implementation was the home search process. The search process using a set of holiday requirements provided by the user was implemented using a search algorithm. This algorithm took the requirements as input and provided the most suitable homes based on the search criteria described in the table below.

Requirements that must be fulfilled	
i)	Occupancy of the home being greater or equal to the number of people accompanying the user.
ii)	Home should not be blacklisted.
iii)	Home should not be reserved at the time of searching.
iv)	Home should be in the county specified by the user.
Requirements that must be fulfilled if they are specified by the user	
i)	Home with wheelchair accessibility.
ii)	Kids friendliness if at least one kid is accompanying the user.
iii)	Home where pets are allowed by the owner.
iv)	Home where smokers are allowed by the owner.
v)	Home with a car parking.
Requirements that are optional but are needed by the user	

i)	Swimming pool.
ii)	Wi-Fi.
iii)	Television.
iv)	Air Conditioner.
v)	Private gym.
vi)	Homeworker(s).
vii)	Security guard(s).
viii)	Private garden.
ix)	The home tier being the same as the tier of the home being exchanged with by the user.
x)	Subcounty specified by the user.

Table 4. Holiday home search criteria

The requirements that must be fulfilled are very crucial in the home required and are considered in all home searches because, without them, the stay at the destination will be impossible. For instance, the home's capacity cannot be less than the number of people accompanying the user. The requirements that must be fulfilled in case the user requires them are also crucial but are considered if the user specified them. The other requirements as shown in table 5.3 above are important for the most optimal search results but if they lack in a home, the home still qualifies to be listed in the search results. This is because it's not always the case that all requirements will be met by an available home. For instance, since a sub-county is a smaller region in the county, it will be good if the home is based in it but if a home not there but is based in the county specified, it will still qualify. These criteria were established to get the most reasonable results for the user.

One other important part of the platform is the exchange points system. It helps in accomplishing a cashless transaction in situations where homes in different tiers were being exchanged. On adding a home, users get a reward of 750 points regardless of the tier the home will be classified in. The number of points exchanged is based on the difference in the tiers in the 2 homes. With that, the various tiers were given a value in terms on exchange points as shown below:

- Tier 1 – 1500 points
- Tier 2 – 1200 points
- Tier 3 – 900 points

- Tier 4 – 600 points
- Tier 5 – 300 points

The points transacted are therefore equivalent to the difference in the points for the tiers. For instance, where an exchange is done between a home in tier 2 and tier 4, 600 points are deducted from the owner of the tier 4 house and given to the owner of the tier 2 house. This is because the difference in value between the two tiers is 600 points.

$$\text{Points transacted} = \text{Value of home of higher tier} - \text{Value of home of lower tier.} \quad (1)$$

Various requirements, both hardware and software, were established at the time of completion of the development phase.

4.3 Testing

4.3.1 System Testing

Data flow testing, a white box testing method, was used where the collection of information on how the various variables flow in the program. The result of each variable is examined as to whether true or false at each stage in the flow. This helped in validating the outputs of the various functions and algorithms implemented in the application.

4.3.2 Machine Learning Testing

In the model training process, the dataset was split such that 70% was used as training data and 30% is used as testing data. Training data was used in understanding the dataset that was created and the testing was used in making the tier prediction on its own and comparing its prediction against the real tier classification. The comparison of its prediction against the actual classification is basis of the model's performance and is measured as a performance.

5. RESULTS

5.1 System testing results

Module Tested	Tested	Result
Registration	Registering using an existing email address	Email address exists
Login	Login with a wrong email address and/or password. Login with an unregistered email address.	Invalid username or password. Enter correct credentials if required.
Home comments	Customer posts comment about a home	Comment posted successfully
Available homes	Customer filters for homes that are not available at the time of the search	Home not found
Homeowner rating	Customer rates homeowner	Homeowner rated successfully

Table 5. Software test results

5.2 Machine Learning test results

After iterative testing and improvements, the model managed to get an accuracy of 72% from 266 instances in the dataset. As shown in the figure below, a breakdown of the results for each tier is also represented by the rows above labelled 1 to 5 which represent the tiers which are the target variables. For each tier, the column labeled precision gives the ratio of true positives against the total number of positives given in the prediction, for

instance in tier 1, it is the ratio of the number of correct tier 1 predictions against the total number of tier 1 predictions.

$$\text{Precision} = \frac{true\ positives}{(true\ positives + false\ positives)} \quad (2)$$

The column labeled recall represents the ratio of the true positives against the sum of true positives and false negatives. It is intuitively the ability of the model to get all positive values for each tier, for instance in the tier 1 context, true positives and false negative represent the total number of tier 1s. The ratio therefore gives the number of true tier 1 predictions against the total number of tier 1s in the sample.

$$\text{Recall} = \frac{true\ positives}{(true\ positives + false\ negatives)} \quad (3)$$

F1-score represents is a harmonic mean of the precision and recall values for each tier.

$$\text{F1} - \text{score} = 2\ *\ \frac{(precision * recall)}{(precision + recall)} \quad (4)$$

Out of the sample used in testing, each tier had its number of rows randomly collected for the process. This figure is represented by the column labeled support. When you add up the values of that column it totals to the number of rows in the dataset used in testing which in this instance is 133 as represented in the subsequent rows in the figure below.

The figure below shows a screenshot of the final training result and its breakdown.

	precision	recall	f1-score	support
1	0.77	0.69	0.73	29
2	0.61	0.74	0.67	27
3	0.79	0.85	0.82	27
4	1.00	0.39	0.56	28
5	0.65	1.00	0.79	22
accuracy			0.72	133
macro avg	0.76	0.74	0.71	133
weighted avg	0.77	0.72	0.71	133

Figure 5. Machine learning test results

The figures above are presented in decimal format but have direct proportionality with percentage representation.

6. DISCUSSION

Several testing activities were done on the implementation of the system. This was important to demonstrate that the system had fulfilled its various objectives. Although some aspects of the system such as the various home features used for analysis and home ranking had not been covered comprehensively, the study tried to cover the basic requirements for the implementation.

Based on the experiment results obtained in the testing phase, homes can be classified into tiers based on the various features they have using the K-Nearest Neighbors algorithm. The 18 features that were used were fed into the algorithm and based on the classification rules, a home is matched with a home tier. On classification during the home registration process, the homeowners easily can do exchanges fairly without having to make financial transactions thanks to the exchange points system.

The system's home search criteria also makes it possible for users to easily get the most suitable home available for an exchange from the numerous homes listed as available. Having features categorized based on their criticality ensures that all the users get homes that meet at least all the basic holiday home requirements for an enjoyable experience.

7. CONCLUSION

It was concluded that it is necessary to provide a low-cost alternative to in terms of holiday home reservations to get tourism thriving both locally and internationally. This can be evidenced by some of the factors that were brought out in chapter 2. It is also necessary to avail the holiday homes option to those who do not enjoy staying in the existing shared accommodation facilities or homes. The web-based platform helps solve the problem by providing those alternatives for the tourists. It does this by allowing cashless transactions given the exchange points system that can be used in the ecosystem for transactions in cases where there is an imbalance in the home ranking. People can now make low-cost vacation reservations given the deduction of the accommodation costs from the holiday costs through the platform and get vacation homes that build a memorable holiday experience.

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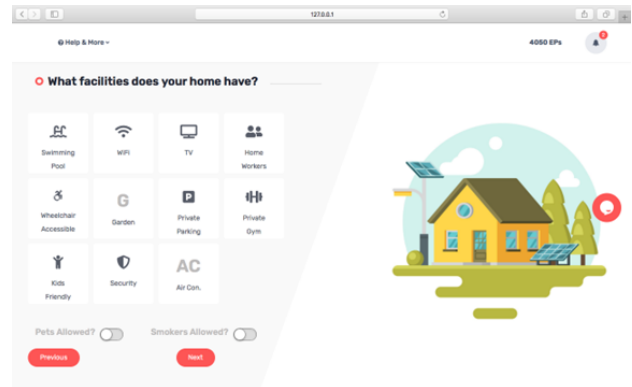
APPENDIX

APPENDIX A: CORRELATION OF NUMBER OF BEDROOMS WITH HOME TIER IN ORANGE DATAMINING SOFTWARE
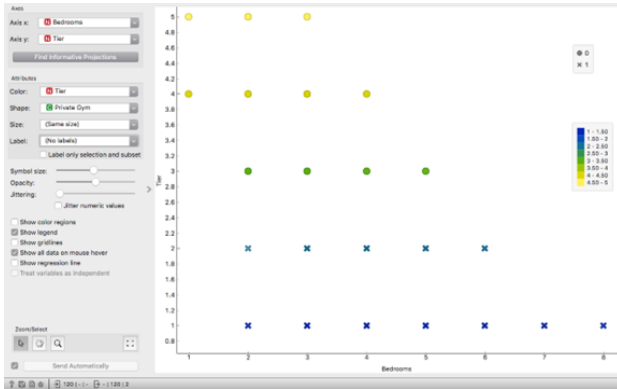
APPENDIX B: HOLIDAY DESCRIPTION PAGE SCREENSHOT
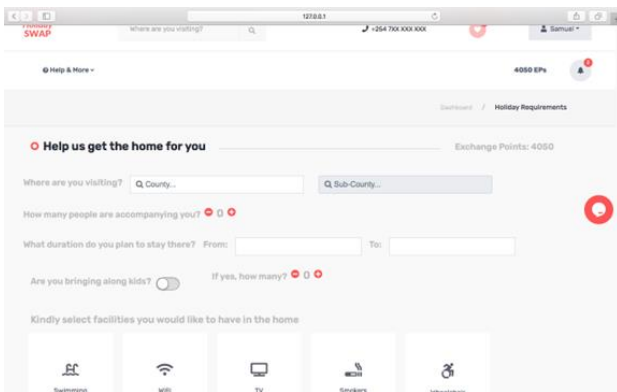
APPENDIX C: ADD HOME PAGE SCREENSHOT

APPENDIX D: HOME DASHBOARD SCREENSHOT