Implementation Of Sequential Searching Algorithm In Car Sales E-Commerce Web

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Abstract: The sequential searching algorithm is an algorithm that performs a search by matching the data to be searched with all the data in a group of data in a sequential manner starting from the first data until the data can be found. The development of information and communication technology has brought significant changes in various aspects of life, including in the world of commerce. E-commerce has become a popular platform for carrying out buying and selling transactions, including car sales. Selling cars via e-commerce offers many benefits for buyers and sellers. For buyers, e-commerce provides easy access to a wide selection of cars at competitive prices. For sellers, e-commerce expands their market reach and allows them to reach more customers. However, as the number of products available on e-commerce websites increases, finding the desired product becomes increasingly difficult. This can cause frustration for buyers and result in decreased sales. This research aims to discuss the implementation of sequential search algorithms on car sales e-commerce websites. This algorithm is expected to help buyers find the car they want more easily and quickly, thereby increasing buyer satisfaction and increasing sales for sellers.

Keywords: Sequential Searching, Web, E-Commerce

Introduction

Electronic commerce (E-commerce) platforms that have tremendous opportunities to grow businesses by creating deals and advertising to increase profits. Information systems are internal organisational systems that serve the needs of processing daily transactions, supporting operations, shaping the management and strategic operations of the organisation, and providing the necessary reports to many parties, This research was conducted with the aim of building a web-based car sales information system that can assist users in finding the car sales data they need (Alawiyah et al. 2022).

Search engines are sites on the web that are designed to help users find information stored on other sites and are like vehicles that we use in exploring the universe in cyberspace. Without a search engine, we can only rely on a specific website address to access the information we need, even if we have a website address. This will make us unable to move anywhere and will not access any website, one example in implementing a search engine or search engine is a sequential searching algorithm. In making this search

system, algorithms are needed as a thought process on computers to search quickly and accurately (Santoso, Sundawa, and Azhari 2016).

Search engines are very helpful for users in the search process. Among other things, to find information about the types and kinds of cars quickly, become a very important source in terms of searching for information or an important thing that we want to find, get information recommendations that suit the needs of users in the search process, easy to operate and search engines become an alternative to a website (Viky, 2016).

Vriyaldo Podomi, Servi Stevi Sumendap 2018).

One of the problems when not using a search engine is Limited Access to Information, without a search engine, users must manually explore various websites to find the information they need and also the difficulty of finding the right information, without a search engine, users may have difficulty finding the right information because they have to rely on website navigation. The solution offered to the problem is Using search engines allows users to quickly and easily find the information they are looking for by entering relevant keywords and Search engines provide sophisticated search algorithms to present results that are relevant to the keywords entered by users, making it easier for them to find the right information.

Sequential Searching algorithm is searching for data by comparing each element of the array one by one in a row starting from the first element until the searched element is found or until the last element of the array. Sequential Search is one of the basic search techniques that is searched based on an existing array by comparing the keywords entered starting the search from the first until the data is found (Rizqullah and Komala Sari 2022).

Methodology

This research uses a qualitative approach with descriptive methods as a methodological framework. Where, according to (Purba et.al., 2019). Descriptive research method is a research approach that aims to provide an in-depth explanation of a problem or object. This type of research can be carried out both quantitatively and qualitatively, and is usually carried out by researchers to answer one or more questions related to the object or situation being studied. The author used a qualitative research method, which adopted a qualitative descriptive approach. The focus of this research is to explain how the design of a Web-based Car Sales Data Information System can improve employee performance. Data obtained through observations and interviews are described through words and sentences, not through numbers.

Data Collection Technique

Some of the techniques applied in this research include:

1. Observation Technique

    In an effort to collect data and understand the system in operation, the observation technique is the most essential and frequently used method. This approach provides data with a very high level of reliability and accuracy. The observation technique involves direct observation of the object of research to gain an understanding of how the system works. In this case the author makes observations at the car showroom

office, especially the archives stored in monitoring and managing the Car Sales data management process.

2. Interview Technique

The interview technique involves the process of asking questions directly to sources related to the issues being discussed. In this context, questions were asked according to the research needs to the car showroom employees. The aim is to complement and confirm the data and information that has been obtained from the observations that have been made previously.

The following questions were asked to employees and showroom owners:

a. What is your strategy to market our website so that it can be recognised and accessed by many people?
b. What promotional media will be used to spread information about this website?
c. Who will be responsible for managing and improving the content on the website?

3. Documentation

Documentation techniques are used to enrich and improve the accuracy and validity of data or information derived from field documentation materials. This technique can be used as a tool to verify the validity of the data. The document analysis process involves collecting data from archives and documents relevant to the research, both inside and outside the research location. This approach aims to collect information contained in existing documents. The aim is to complement and support the data that has been obtained through observations and interviews.

4. Literature Study

This data collection method technique involves exploration and research through the study of scientific books, relevant writings, and other literature references.

Data Analysis Technique

Process Analysis

Process analysis is a method used to understand and analyse how a process or series of activities is carried out. In this study the authors used the waterfall method.

According to the opinion of (Susilo, 2018) The waterfall method is a software development approach that involves building systems in stages by prioritising the delivery of operable and useful functionality in each iteration.
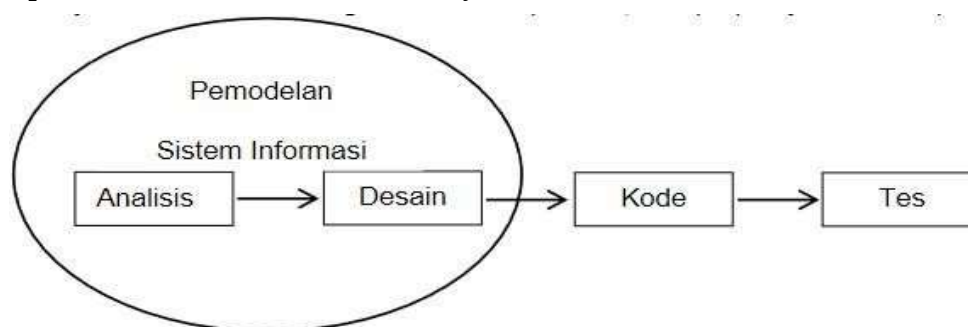

Illustration of the waterfall model (Rajasa Manurung and Heryana 2023)

Based on Figure 3.1 Illustration of the Waterfall Model, the stages are as follows:

1. Analysis

In the software requirements analysis stage, the author conducts on-site research to collect data and identify software requirements. The goal is for software users to clearly understand the type of software they need.

2. Design

In this phase, the authors implement a multi-process system design that concentrates on the design of the sales information system programme. This includes data structures, software architecture and coding methods. This phase transforms the software requirements from the requirements analysis stage into a design representation, which can then be implemented in the next stage of programme development.

3. Code

The design must be implemented into the software. At this stage, the result is a computer programme that matches the design that was made in the design stage.

4. Testing

In this stage, the author performs specific tests on the system that has been built logically and functionally, checking each part to ensure the whole is tested. The goal is to reduce errors and ensure that the output results are as desired.

Result and Discussion

This research produces a web-based car sales information system that uses the Sequential Searching algorithm to facilitate users in finding cars. The following is a description of the results of this research:

1. System Design and Development

- The Analysis Stage, begins through software requirements identified through direct research at the location, collecting relevant data from Merdeka Mobilindo Bengkulu. The analysis results show the need for an efficient and accurate search system.
- Design Stage, at this stage the system is designed using a multi-process approach, including data structures, software architecture, and coding methods. This design is implemented in software designed to effectively manage car sales data.
- Code Stage, from the system design is implemented into the programme using Visual Studio Code as the IDE, and XAMPP as the local server. The resulting code implements the Sequential Searching algorithm to process car data searches.
- Testing Stage, at this stage the system is tested logically and functionally to ensure all parts work as expected. Testing is done using various web browsers such as Google Chrome and Microsoft Edge.

2. Use of Sequential Searching Algorithm

- The Sequential Searching algorithm is applied to facilitate the search for car data. This algorithm compares each data element sequentially until it finds the element it is looking for. The implementation of this algorithm ensures that the search is done quickly and accurately, especially for relatively small data sets.

3. System Feasibility

- Technological Feasibility, the use of including Visual Studio Code, XAMPP, and a web browser, has proven adequate in supporting the development and operation of the system. The use of these technologies enables efficient system development and can be operated properly by users.
- Legal Feasibility, All software used is open source, eliminating the risk of legal offences related to the use of pirated software. This ensures that the system operates legally and in accordance with applicable regulations.
- Operational Feasibility, The website is designed with a simple and intuitive interface, making it easy for users to search and access car sales data. The system is adapted to the access rights and devices used by each user, so that each user can easily utilise the available features.

4. System Benefits and Advantages

- Ease of Access and Use, The information system built provides a friendly and easy-to-use user interface, so that users can easily search for the desired car without requiring a long time.
- Search Efficiency, with the implementation of the Sequential Searching algorithm, the car data search process becomes faster and more efficient. This algorithm ensures that each search is conducted systematically and accurately, minimising the time needed to find the desired data.
- Improved Data Management, the system facilitates the management of car sales data, allowing quick and accurate access to the required information. This helps Merdeka Mobilindo Bengkulu manage sales data more effectively.

5. Interface Display

The following is a view of the user interface:

- Homepage View

Figure 1. Homepage View

- About view

About contains information about ecommerce.

Figure 2. About Page

- Shopping View

Shopping page contains products that can be selected for further ordering.

Figure 3. Shopping Display

- Product Display

Contains a list of products that can be seen by name, photo and clicked if you want to choose.
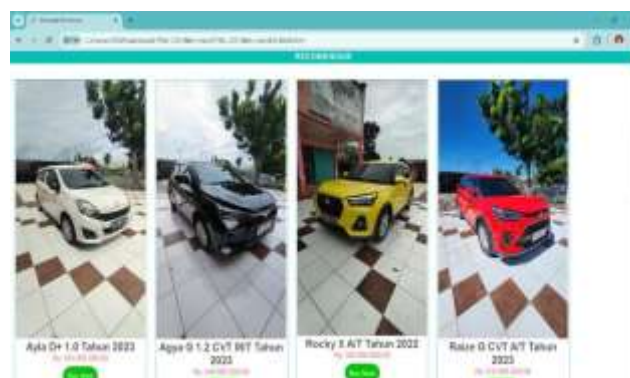

Figure 4. Product Display

- Registration View

The signup view is useful for registering new customers, by inputting Fullname, email and password for the first time, which can later be used to enter the system.

Figure 5. Register Page

The following is the interface for the admin
1. Dashboard

On the admin dashboard there is a menu on the left, on the top right there is information about the statistics of the data owned.

Figure 6. Admin Dashboard Display

2. Manage Cars

On the manage car page, the admin can manage car data by adding, editing, deleting existing car data.

Figure 7. Manage Car

3. Manage Bookings

On the manage booking page, the admin can manage user orders, edit or delete order data.
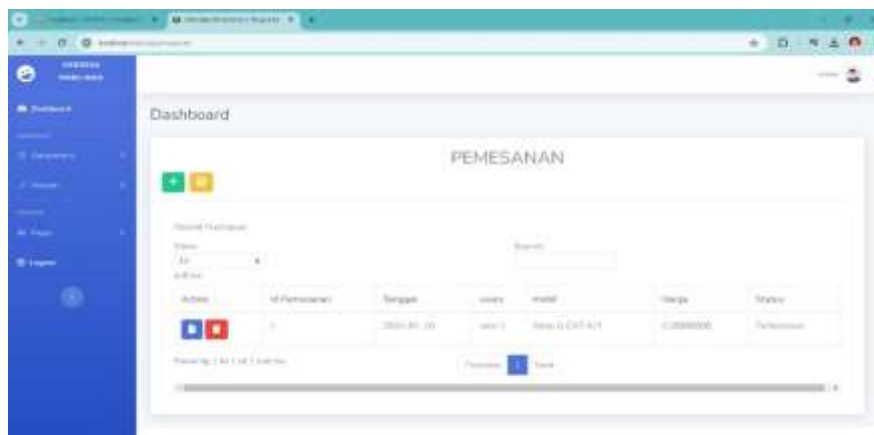

Figure 8. Manage Bookings

4.   Manage Admin
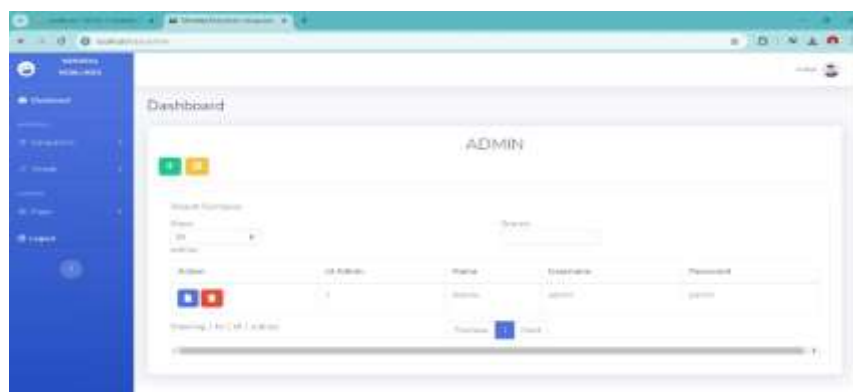   On the admin page, the admin can manage admin data add, edit or delete data.

Figure 9. Manage Admin

5.   Manage User
      In the manage user table, the admin can manage users, edit, delete or add manually.

Figure 10. Manage Users

Discussion

In this section, the author will discuss the implementation and testing of a web-based car sales information system that uses the Sequential Searching algorithm. This discussion includes details on how the system is implemented and tested to ensure its performance in accordance with the previously identified needs.

1. Preparation of the Development Environment

- Software

The system was built using Visual Studio Code as the IDE, XAMPP as the local server (including Apache HTTP Server and MySQL database), and web browsers such as Google Chrome and Microsoft Edge for testing.

- Hardware

Laptop with appropriate specifications, including Intel Core i3 processor, 8GB RAM, 512GB hard disk, and NVIDIA GeForce GT 540M graphics card.

2. Backend Development

- Database

The car sales data is stored in a MySQL database. The table structure includes columns such as id, brand, model, year, price, mileage, colour, and description.
The implementation of the database that has been created is as follows:
The database consists of 5 tables including admin, card, car, booking, users.
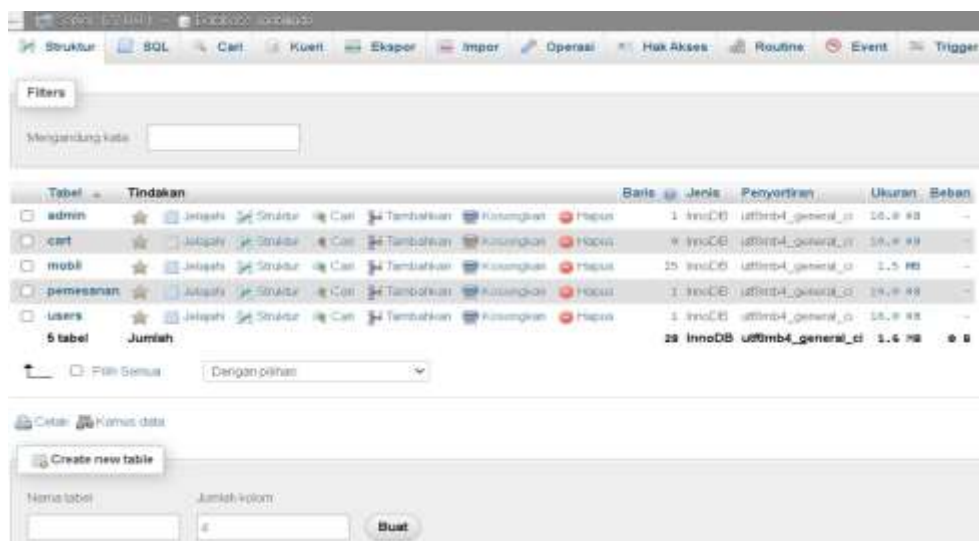

Figure 4. 11. Database Table

- Server-Side Scripting

PHP is used to connect and manipulate data in the database. PHP scripts are implemented to retrieve data from the database and display search results.
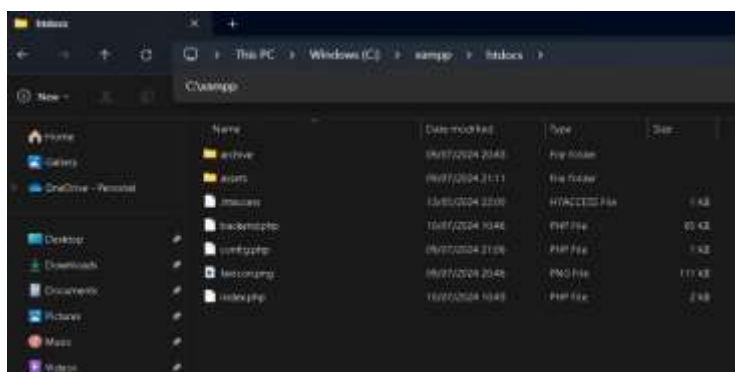The local server is placed on localhost with the following file structure:

Figure 4. 12. File Structure on Server

3. Frontend Development

- User Interface

The web interface was developed using HTML, CSS, and JavaScript. The simple and intuitive interface design ensures ease of use.

Figure 4. 13.Users Interface Display Form

- Search Form

The search form allows users to enter search criteria such as car make, model, year, price, and others to find the desired car. This form interacts with the backend to display search results.

The following is a search form to search for car data according to the inputted keywords:

Figure 4. 14. Search Form

4. Sequential Searching Algorithm Implementation

- Logical Search

The Sequential Searching algorithm is implemented in PHP. This algorithm processes the search request by going through each element in the database sequentially until it finds the element that is searched until all elements have been checked.

- Efficiency

This ALlgorithm makes it possible for the calibration process to be carried out quickly, especially for relatively small daltal collections.

The following is the code implementation for the sequential searching method:

```
$q="";
if(isset($_REQUEST['keyword'])){$kw=$_REQUEST['keyword'];$q=" WHERE model like
'%$kw%'";}
$rs=$this->cn->query("select * from mobil $q");
while($r=$rs->fetch_array()){
        echo "
                <div class='foto'>
        <img id='mainImage$r[0]'
src='data:image/jpg;base64,".base64_encode($r['photo'])."'>
        <h3>$r[model] Tahun $r[tahun]</h3>
        <p>Rp.".number_format($r['harga'], 2, ",", ".")."</p> <br>
        <a href='#' id='lihat$r[0]'>Lihat</a>
</div>
                ";
                                echo "
                <div class='modal fade' id='imageModal$r[0]' tabindex='-1' role='dialog' aria-
labelledby='exampleModalLabel' aria-hidden='true'>
    <div class='modal-dialog modal-lg' role='document'>
     <div class='modal-content'>
      <div class='modal-header'>
       <h5 class='modal-title' id='exampleModalLabel'>$r[model] Tahun $r[tahun]</h5>
       <button type='button' class='close' data-dismiss='modal' aria-label='Close'>
        <span aria-hidden='true'>&times;</span>
       </button>
      </div>
      <div class='modal-body'>
       <img id='largeImage' src='data:image/jpg;base64,".base64_encode($r['photo1'])."'
alt='Large Image' class='img-fluid mb-1'>
        <div class='row'>
         <div class='col-3'>
          <img src='data:image/jpg;base64,".base64_encode($r['photo2'])."' alt='Small Image 1'
class='img-thumbnail'>
         </div>
         <div class='col-3'>
          <img src='data:image/jpg;base64,".base64_encode($r['photo3'])."' alt='Small Image 2'
class='img-thumbnail'>
```

```
        </div>
        <div class='col-3'>
          <img src='data:image/jpg;base64,".base64_encode($r['photo4'])."' alt='Small Image 3'
class='img-thumbnail'>
        </div>
        <div class='col-3'>
          <img src='data:image/jpg;base64,".base64_encode($r['photo5'])."' alt='Small Image 4'
class='img-thumbnail'>
        </div>
      </div>
              <div class='row'>
                      <div class='col-12'>DP ".number_format($r['dp'],0,',','.')."</div>
                      <div class='col-12'>Angsuran 5 Tahun
".number_format($r['angsuran5'],0,',','.')."</div>
                      <div class='col-12'>Angsuran 6 Tahun
".number_format($r['angsuran6'],0,',','.')."</div>
              </div>
    </div>
    <div class='modal-footer'>
     <button type='button' class='btn btn-secondary' data-dismiss='modal'>Close</button>
              <a class='btn btn-primary' href='".$this->p."/action/cart/id/$r[0]'>Beli</a>
    </div>
   </div>
  </div>
 </div>


 <script>
  $(document).ready(function(){
   $('#lihat$r[0]').on('click', function(){
    $('#imageModal$r[0]').modal('show');
   });
  });
 </script>";
```

Conclusion

This research has successfully developed a web-based car sales information system that uses sequential searching algorithms to help users find car sales data quickly and accurately. From the results of testing and evaluation, some of the main points that can be concluded are: (1) The sequential searching algorithm proved to be effective in searching car sales data in the database. Although simple, this algorithm is able to provide accurate search results in a relatively fast time for a small amount of data. (2) The information system built is easy to use by users. The intuitive interface and simple search features allow users to easily search for cars based on various criteria such as brand, model, and price. (3) With the sequential searching-based search engine, users no longer need to manually browse various websites to search for car information. This increases efficiency and accessibility of information for users.

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