

A Renting Application based on Data Mining and Business Analytics

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Abstract: It'll implement the site for different cities. Instead of providing the products of a showroom only rental the application acts as a relationship between the user and rental showroom owners. There is no limitation of renting waiting rooms for our website. This means that all rental showroom owners want to view their products on our website, so they simply register on our website, providing personal information and credit card number. This application provides some additional functionality for vendors to modify or delete their products. Customers do not need to register on our site just search and place orders on our site. We are responsible for communication between the customer and the seller and keep the database. It also provides an additional module that accepts customer feedback. The application provides additional functionality that is "reallocation services". There are many rental systems available online. But, they are not providing all the products in one place. Also, many of them limited to just one city. This means that the car rental system on offers online only with cars. In addition, many of them do not provide effective communication between the customer and the seller. In addition, the current rental systems limited to one supplier mean that the products are provided only by a rented showroom.

Keywords: Economic diminishing and data mining

1. Introduction

The Online Renting has become important factor in modern society hence the need to have a rental Online Renting system. Renting any product has a central importance to quality of life with considerable economic, social, cultural and personal significance. Though a country's national prosperity is usually measured in economic terms, increasing wealth is of diminished value unless all can share its benefits and if the growing wealth is not used to redress growing social deficiencies, one of which is housing (Erguden, 2001). Housing plays a huge role in revitalizing economic growth in any country, with shelter being among key indicators of development. Hiring Motor Vehicles, Service Apartments, Hotels, Guest Houses, Meeting and Conference Halls, Audio visuals, Party rentals, Computers and Other Products a basic human right demands that urban dwellers should have access to a decent housing, defined as one that provides a foundation for rather than being a barrier to good physical and mental health, personal development and fulfillment of life objectives (Seedhouse, 1986).

The focus of this research project is basically managing anything on rent for low income, medium and high incomes

households or what is commonly known as affordable housing. Affordable is a term used to describe individual's capability to pay for certain products or services because their income is enough to do so. Although the term affordable products are often applied to rental products; that is within the financial means of those in the lower income ranges of a geographical area, the concept is applicable to both middle and high income individuals. Most families choose to rent houses, cars etc based on their income and family situations. Developing rental application comes with many advantages especially to the Landlords who are able to increase their profits through rent paid by the users. Increased number of rental users and renters makes management difficult especially for the landlords who are losing huge sum of money through tenants who evade rent.

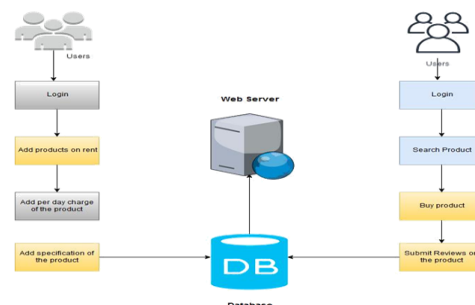


Fig. 1. System architecture

A. Conceptual model

The actual data mining task is the semi-automatic or automatic analysis of large quantities of data to extract previously unknown, interesting patterns such as groups of data records (cluster analysis), unusual records (anomaly detection), and dependencies (association rule mining, sequential pattern mining). This usually involves using database techniques such as spatial indices. These patterns can then be seen as a kind of summary of the input data, and may be used in further analysis or, for example, in machine learning and predictive analytics.

For example, the data mining step might identify multiple groups in the data, which can then be used to obtain more accurate prediction results by a decision support system. Neither the data collection, data preparation, nor result interpretation and reporting is part of the data mining step, but do belong to the overall KDD process as additional steps. A

servlet is a Java class that runs in a Java-enabled server. An HTTP servlet is a special type of servlet that handles an HTTP request and provides an HTTP response, usually in the form of an HTML page. The most common use of WebLogic HTTP Servlets is to create interactive applications using standard Web browsers for the client-side presentation while WebLogic Server handles the business logic as a server-side process. WebLogic HTTP servlets can access databases, Enterprise JavaBeans, messaging APIs, HTTP sessions, and other facilities of WebLogic Server.

2. Literature survey

1. Key Technologies for Security Enhancing of Payment Gateway Author name: Xuewang Zhang, Linlin Wang The
2. secure payment gateway is necessary for ensuring the development of E-commerce. The breaking down of hash algorithm of MD5 and the like have imposed great potential security hazard on payment gateway.
3. International Rental Housing Policies Author name: Xuewang Zhang, Linlin Wang, In recent years, the stock of rental housing in Canada has decreased as purpose-built rental starts have slowed and existing stock has been converted from rental to ownership. The objectives of this research project were to compare the Canadian rental market to those in other countries, and to explore the private rental housing programs and initiatives adopted in other countries.
4. Business Intelligence/Data Analytics for Online Fashion Store Author name: YashVira, Mitesh Vishwasrao An optimized web application that adheres to the manifold needs of customers of a fashion wear company (provided with a customizable catalogue for wholesale as well as retail customer). Being able to survive in times of highly competitive markets.

3. Our approach

A. Technical approach

Data mining process is the discovery through large data sets of patterns, relationships and insights that guide enterprises measuring and managing where they are and predicting where they will be in the future.

1. *Business understanding*: First, it is required to understand business objectives clearly and find out what are the business's needs. Next, assess the current situation by finding the resources, assumptions, constraints and other important factors which should be considered.
2. *Data understanding*: The data understanding phase starts with initial data collection, which is collected from available data sources, to help get familiar with the data. Some important activities must be performed including data load and data integration in order to

make the data collection successfully.

3. *Data preparation*: The data preparation typically consumes about 90.

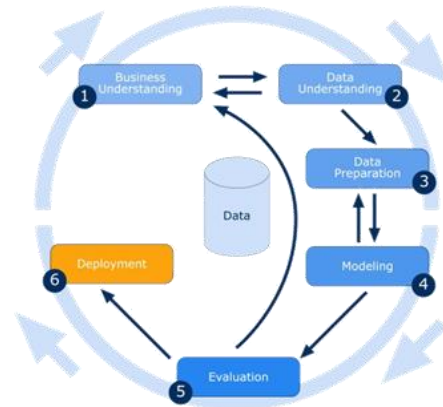


Fig. 2. Data mining

4. *Modeling*: First, modeling techniques have to be selected to be used for the prepared data set. Next, the test scenario must be generated to validate the quality and validity of the model. Then, one or more models are created on the prepared data set. Finally, models need to be assessed carefully involving stakeholders to make sure that created models are met business initiatives.
5. *Evaluation*: In the evaluation phase, the model results must be evaluated in the context of business objectives in the first phase. In this phase, new business requirements may be raised due to the new patterns that have been discovered in the model results or from other factors.
6. *Deployment*: The knowledge or information, which is gained through data mining process, needs to be presented in such a way that stakeholders can use it when they want it. Based on the business requirements, the deployment phase could be as simple as creating a report or as complex as a repeatable data mining process across the organization. In the deployment phase, the plans for deployment, maintenance, and monitoring have to be created for implementation and also future supports.

Data mining is the process of discovering patterns in large data sets involving methods at the intersection of machine learning, statistics, and database systems. Data mining is an interdisciplinary subfield of computer science and statistics with an overall goal to extract information (with intelligent methods) from a data set and transform the information into a comprehensible structure for further use. Data mining is the analysis step of the "knowledge discovery in databases" process, or KDD. Aside from the raw analysis step, it also involves database and data management aspects, data pre-processing, model and inference considerations, interestingness metrics, complexity considerations, post-processing of

discovered structures, visualization, and online updating. The difference between data analysis and data mining is that data analysis is used to test models and hypotheses on the dataset, e.g., analyzing the effectiveness of a marketing campaign, regardless of the amount of data; in contrast, data mining uses machine-learning and statistical models to uncover clandestine or hidden patterns in a large volume of data.

The term "data mining" is in fact a misnomer, because the goal is the extraction of patterns and knowledge from large amounts of data, not the extraction (mining) of data itself. It also is a buzzword and is frequently applied to any form of large-scale data or information processing (collection, extraction, warehousing, analysis, and statistics) as well as any application of computer decision support system, including artificial intelligence (e.g., machine learning) and business intelligence. The book *Data mining: Practical machine learning tools and techniques with Java* (which covers mostly machine learning material) was originally to be named just *Practical machine learning*, and the term data mining was only added for marketing reasons. Often the more general terms (large scale) data analysis and analytics – or, when referring to actual methods, artificial intelligence and machine learning – are more appropriate.

The actual data mining task is the semi-automatic or automatic analysis of large quantities of data to extract previously unknown, interesting patterns such as groups of data records (cluster analysis), unusual records (anomaly detection), and dependencies (association rule mining, sequential pattern mining). This usually involves using database techniques such as spatial indices. These patterns can then be seen as a kind of summary of the input data, and may be used in further analysis or, for example, in machine learning and predictive analytics. For example, the data mining step might identify multiple groups in the data, which can then be used to obtain more accurate prediction results by a decision support system. Neither the data collection, data preparation, nor result interpretation and reporting is part of the data mining step, but do belong to the overall KDD process as additional steps [7].

Given a unit sphere, a "triangle" on the surface of the sphere is defined by the great circles connecting three points u , v , and w on the sphere. If the lengths of these three sides are a (from u to v), b (from u to w), and c (from v to w), and the angle of the corner opposite c is C , then the law of haversines states [6]:

$\text{hav}(c) = \text{hav}(a) + \text{hav}(b) - 2 \text{hav}(a) \text{hav}(b) \cos(C)$. Since this is a unit sphere, the lengths a , b , and c are simply equal to the angles (in radians) subtended by those sides from the center of the sphere (for a non-unit sphere, each of these code can be inserted in HTML/ XML pages or both. JSP is first converted into servlet by JSP container before processing the client's request. arc lengths is equal to its central angle multiplied by the radius R of the sphere). In order to obtain the haversine formula of the previous section from this law, one simply considers the special case where u is the north pole, while v and w are the two points

whose separation d is to be determined. In that case, a and b are $2 \theta_1$, $2 \theta_2$; $2 \theta_1$; $2 \theta_2$ (i.e.; co latitudes)[6]:

To derive the law of haversines, one starts with the spherical law of cosines:

$$\cos(c) = \cos(a) \cos(b) + \sin(a) \sin(b) \cos(C)$$

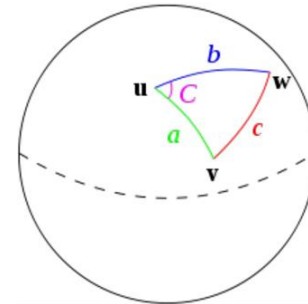


Fig. 3. Haversine formula

B. Theoretical approach

Tomcat is an application server from the Apache Software Foundation that executes Java servlets and renders Web pages that include Java Server Page coding. Described as a "reference implementation" of the Java Servlet and the Java Server Page specifications, Tomcat is the result of an open collaboration of developers and is available from the Apache Web site in both binary and source versions. Tomcat can be used as either a standalone product with its own internal Web server or together with other Web servers, including Apache, Netscape Enterprise Server, Microsoft Internet Information Server (IIS), and Microsoft Personal Web Server. Tomcat requires a Java Runtime Enterprise Environment that conforms to JRE 1.1 or later. It stands for Java Server Pages. It is a server side technology. It is used for creating web application. It is used to create dynamic web content. In this JSP tags are used to insert JAVA code into HTML pages. It is an advanced version of Servlet Technology. It is a Web based technology helps us to create dynamic and platform independent web pages. In this, Java code can be inserted in HTML/ XML pages or both. JSP is first converted into servlet by JSP container before processing the client's request.

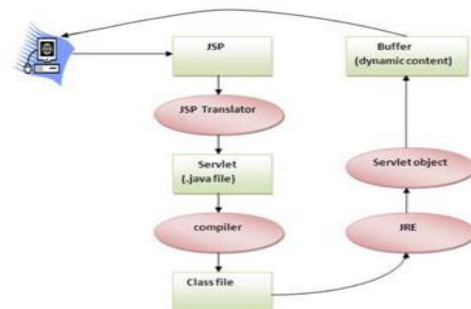


Fig. 4. Java based web application

Payment Gateway Integration: Users are constantly paying for premium membership, advanced functionality and SaaS. Once they've found what they need, they want to effortlessly pay for this. They need to fill out respective payment information on your website to check-out and choose their preferable payment method if there are multiple options available. The gateway will then collect the payment information and transfer it (with secure encryption) to the processing bank of authorization. The processing bank will make a request through Visa's or MasterCard's payment network on the card. American Express and Discover authorization process is much simpler. The card issuer then approves/declines the transaction or requests additional authorization from the cardholder. The processing bank then forwards to the response, through the gateway back to the merchant. You should finalize the transaction accordingly. If the transaction is successful, the merchant deposits the receipt with the processing bank. The payment processor then adds the funds to the merchant's account and passes the transaction to Visa/MasterCard for a settlement. The card issuing company then pays the processing bank, while simultaneously taking out the funds from the card issuer's account. Finally, the issuing bank adds the transaction to the cardholder's account and requests the payment in a monthly statement (or debits the amount immediately).

4. Future scope

Without a doubt, rental industry is brimming and growing very well. These days people prefer renting over buying. Now, people have realized that those items are not just meant to lie in the attic, but can be a source of some extra bucks in the pocket. Every item, new or used, has a value. You must have heard of different online renting platforms. They have a huge market, and business owners are earning a good amount of money by investing in them. But, they all are niche specific like car renting, property renting etc. What if a platform allows

customers to rent or buy multiple things (cars, books, jewelry)? This kind of one stop solution shop surely promises a great future!

5. Conclusion

The online renting store is serving the needs for both wholesalers as well as retailer (customers). The renting store web application also provides solution for payment gateway. The report parameters are nothing but database attributes used to convert these attributes from database value to pictorial report formats. BI tools convert these database attributes into the type of Chart or Reports by inputting the data sets from the MySQL database. The online renting store stores all the records of the items purchased by both the retail as well as the whole customers. The BI tools are used to develop reports relating to products and sales. These reports help the company to identify the key areas for business expansion and improvement.

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