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VEHICLE INSURANCE

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ABSTRACT— In our project we will be developing patterns, models which will help the pricing of insurance product. Optimization of risks, managing business strategies, frequent claims can be analyzed how much claim is settled. False analyzation also needed so that it will help to get the product price. The suitable algorithm to be used then patterns can be generated. The main problem is to find and get the proper dataset. It will help to analyze to create the model. The Vehicle Insurance Management System is developed using Python programming language and utilizes various libraries and frameworks such as Tkinter for the graphical user interface (GUI), SQLite for database management, and Pandas for data analysis and reporting. The system offers scalability, reliability, and security to ensure smooth operation in real-world insurance scenarios. The Vehicle Insurance Management System is a comprehensive solution for insurance companies to efficiently manage their policies, streamline claim processing, and improve customer service. By leveraging the power of Python programming, this project aims to optimize the insurance management process and enhance overall productivity and profitability.

Keywords: **"Python", "Pandas", "NumPy", "Seaborn", "Matplotlib", "Django", "TK inter", "Stream lit", "XL-file", "CSV-file".**

1. INTRODUCTION

In our project we will be developing patterns, models which will help the pricing of insurance product. Optimization of risks, managing business strategies, frequent claims can be analyzed how much claim is settled. False analyzation also needed so that it will help to get the product price. The suitable algorithm to be used then patterns can be generated. The main problem is to find and get the proper dataset. It will help to analyze to create the model. The Vehicle Insurance Management System is developed using Python programming language and utilizes various libraries and frameworks such as Tkinter for the graphical user interface (GUI), SQLite for database management, and Pandas for data analysis and reporting. The system offers scalability, reliability, and security to ensure smooth operation in real-world insurance scenarios. The Vehicle Insurance Management System is a comprehensive solution for insurance companies to efficiently manage their policies, streamline claim processing, and improve customer service. By leveraging the power of Python programming, this project aims to optimize the insurance management process and enhance overall productivity and profitability.

2. LITERATURE SURVEY

A literature review or narrative review is a type of review article. A literature review is a scholarly paper, which includes the current knowledge including substantive findings, as well as theoretical and methodological contributions to a particular topic. Literature reviews are secondary sources, and do not report new or original experimental work. Most often associated with academic-oriented literature, such reviews are found in academic journals, and are not to be confused with book reviews that may also appear in the same publication. Literature reviews are a basisfor research in nearly every academic field. A narrow-scope literature review may be included as part of a peer-reviewed journal article presenting new research, serving to situate the current study within the body of the relevant literature and to provide context for the reader. In such a case, the review usually precedes the methodology and results sections of the work.

Producing a literature review may also be part of graduate and post-graduate student work, including in the preparation of a thesis, dissertation, or a journal article. Literature reviews are also common in a research proposal or prospectus (the document that is approved before a student formally begins a dissertation or thesis).

Dheeraj Razdan "Insurance Principles, Application and Practices" Cyber TechPublication New Delhi 2008, Book no; - 20257 (NIA)

The details of history and origins of insurance business in world are mentioned in the book. The analysis of general insurance business operations and decision making are given in comprehensive pattern. Book analyzes the business policy of insurance in India, claims procedures, salvage disposal. Basic claims settlements, insurance risk management and its procedures of insurance business in India is mentioned in the book. Operation of insurance business in India along with the governmental procedures is also mentioned in detail. The financial procedures and policies are given detail format.
The concept of history and origins of insurance is taken as a reference for study. Janak Raj JAl "Motor Accidents Claims and Procedures" Universal Law Publishing Co Ltd New Delhi 2007, Book No;-19736 (NIA).

3. METHODOLOGY

The research is the base of any thesis, it can be done in various method but there are two methodologies to get the perfect research. They are qualitative and quantitative research method. These two methods are tool for research process. But research method should be selected as per the plan and objective of research. Similarly, it can be conducted within two different ways such as deductive reasoning method and inductive reasoning method. Deductive reasoning is helpful for further research on actual matter but inductive reasoning method is different. In inductive reasoning method the topic needed to be created and have to do further research as per the need of the topic.
For this thesis, both Primary data and secondary sources have been used. Primary data has been collected via telephonic interview. Similarly, secondary data have been collected from few books, articles, journals and thesis, research literatures as well as sources from internet. The data available from annual reports of various insurance companies were also taken for the present study.

Type of Research

The topic for the research study is investment awareness and the nature of the topic is Theoretical and descriptive. So the conduct the research study the type of research suitable is descriptive research only. For the study purpose both primary and secondary data are used. The primary data collected from college students. The secondary data collected from the research papers. The primary and secondary data have been collected to cover everyaspect of the study. These data used in combination as per need of the study. These data having different merits and demerits and have serves our purpose of the research study. These are explained below:

Primary Data

Primary data are information collected by a researcher specifically for a research assignment. Primary data are original in nature and directly related to the issue or problem and current data. Primary data are the data which the researcher collects through various methods like interviews, surveys, questionnaires etc. The primary data have own advantages and disadvantages:

1) **Advantages of primary data:**

Advantages of primary data are as follows:

- The primary data are original and relevant to the topic of the research study so the degree of accuracy is very high.
- Primary data is that it can be collected from a number of ways like interviews, telephone surveys, focus groups etc. It can be also collected through emails and posts. It can include a large population and wide geographical coverage.
- Moreover, primary data is current and it can better give a realistic view to the researcher about the topic under consideration.
- Reliability of primary data is very high because these are collected by the concerned and reliable party.

2) **Disadvantages of primary data:**

Following are the disadvantages of primary data:

- For collection of primary data where interview is to be conducted the coverage is limited and for wider coverage a more number of researchers are required.
- A lot of time and efforts are required for data collection. By the time the data collected, analyzed and report is ready the problem of the research becomes very serious or out dated. So the purpose of the research may be defeated.

- It has design problems like how to design the surveys. The questions must be simple to understand and respond.

Some respondents do not give timely responses. Sometimes, the respondents may give fake, socially acceptable and sweet answers and try to cover up the realities.

Secondary Data

Secondary data are the data collected by a party not related to the research study but collected these data for some other purpose and at different time in the past. If the researcher uses these data then these become secondary data for the current users. These may be available in written, typed or in electronic forms. A variety of secondary information sources is available to the researcher gathering data on an industry, potential product applications and the market place. Secondary data is also used to gain initial insight into the research problem. Secondary data is classified in terms of its source – either internal or external. Internal, or in-house data, is secondaryinformation acquired within the organization where research is being carried out. External secondary data is obtained from outside sources. There are various advantages and disadvantages of using secondary data.

3) **Advantages of Secondary Data:**

Advantages of secondary data are following:

- The primary advantage of secondary data is that it is cheaper and faster to access.
- Secondly, it provides a way to access the work of the best scholars all over the world.
- Thirdly, secondary data gives a frame of mind to the researcher that in which direction he/she should go for the specific research.
- Fourthly secondary data save time, efforts and money and add to the value of the research study.

4) **Disadvantages of Secondary data:**

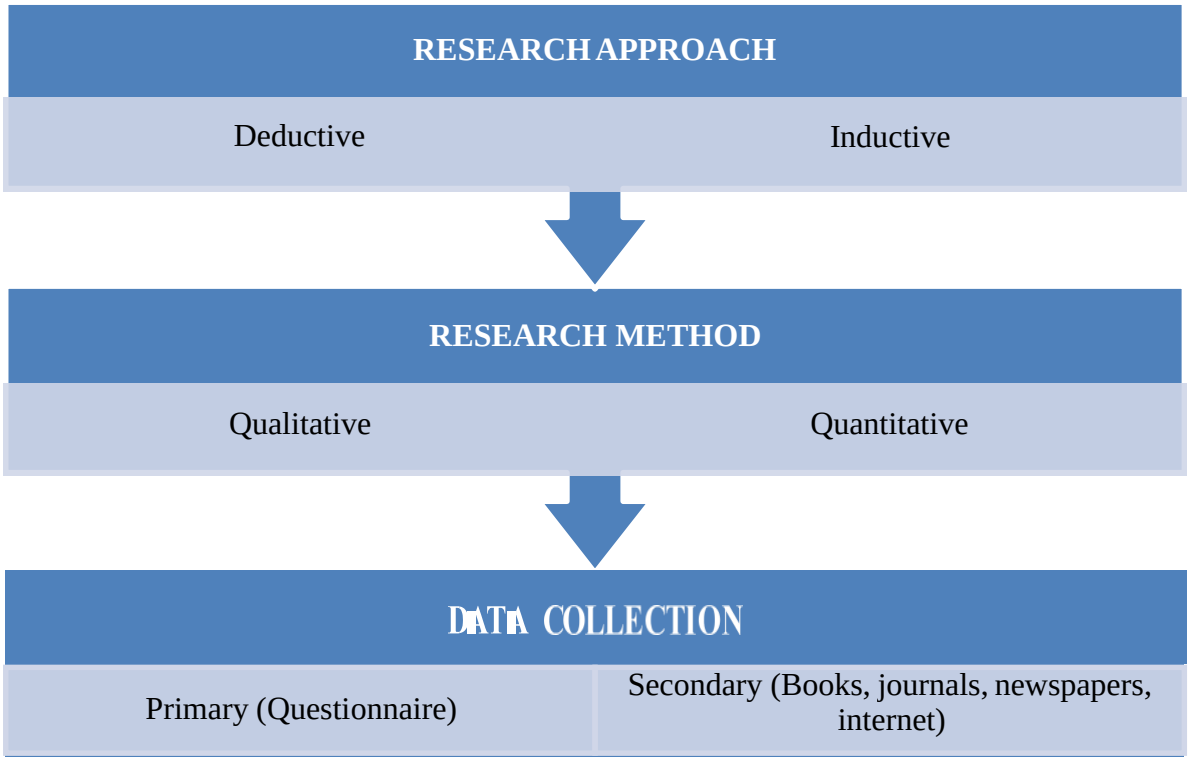
Following are the disadvantage of secondary data:

- The data collected by the third party may not be a reliable party so the reliability and accuracy of data go down.
- Data collected in one location may not be suitable for the other one due variable environmental factor.

Keeping in view the advantages and disadvantages of sources of data requirement of the research study and time factor, both sources of data i.e. primary and secondary data have been selected. These are used in combination to give proper coverage to the topic.

RESEARCH APPROACH: -

The reason for this research is to find out the different types of motor insurance policies avail by various policyholders. There are various ways to carry out this research method and we have used both qualitative and quantitative methods for collecting data. The questionnaires are self-made and information are collected through survey. The questionnaires are in English. There are ten questions. Later the survey answers are analyzed with the help of graphs and charts into excel texts to dragout the result and conclusion.



4. MACHINE LEARNING

Machine Learning is a branch of artificial intelligence that develops algorithms by learning the hidden patterns of the datasets used it to make predictions on new similar type data, without being explicitly programmed for each task.

Traditional Machine Learning combines data with statistical tools to predict an output that can be used to make actionable insights.

Machine learning is used in many different applications, from image and speech recognition to natural language processing, recommendation systems, fraud detection, portfolio optimization, automated task, and so on. Machine learning models are also used to power autonomous vehicles, drones, and robots, making them more intelligent and adaptable to changing environments.

Machine Learning lifecycle:

The lifecycle of a machine learning project involves a series of steps that include:

1. **Study the Problems:** The first step is to study the problem. This step involves understanding the business problem and defining the objectives of the model.
2. **Data Collection:** When the problem is well-defined, we can collect the relevant data required for the model. The data could come from various sources such as databases, APIs, or web scraping.
3. **Data Preparation:** When our problem-related data is collected. then it is a good idea to check the data properly and make it in the desired format so that it can be used by the model to find the hidden patterns. This can be done in the following steps:

a. Data cleaning
b. Data Transformation
c. Explanatory Data Analysis and Feature Engineering
d. Split the dataset for training and testing.

4. **Model Selection:** The next step is to select the appropriate machine learning algorithm that is suitable for our problem. This step requires knowledge of the strengths and weaknesses of different algorithms. Sometimes we use multiple models and compare their results and select the best model as per our requirements.
5. **Model building and Training:** After selecting the algorithm, we have to build the model. In the case of traditional machine learning building mode is easy itis just a few hyperparameter tunings. In the case of deep learning, we have to define layer-wise architecture along with input and output size, number of nodes in each layer, loss function, gradient descent optimizer, etc.

6. **Model Evaluation:** Once the model is trained, it can be evaluated on the test dataset to determine its accuracy and performance using different techniques like classification report, F1 score, precision, recall, ROC Curve, Mean Square error, absolute error, etc.
7. **Model Tuning:** Based on the evaluation results, the model may need to be tuned or optimized to improve its performance. This involves tweaking the hyperparameters of the model.
8. **Deployment:** Once the model is trained and tuned, it can be deployed in a production environment to make predictions on new data. This step requires integrating the model into an existing software system or creating a new system for the model.
9. **Monitoring and Maintenance:** Finally, it is essential to monitor the model's performance in the production environment and perform maintenance tasks as required. This involves monitoring for data drift, retraining the model as needed, and updating the model as new data becomes available.

Types of Machine Learning: -

- Supervised Machine Learning
- Unsupervised Machine Learning
- Reinforcement Machine Learning

1. Supervised Machine Learning: -

Supervised learning is a type of machine learning in which the algorithm is trained on the labeled dataset. It learns to map input features to targets based on labeled training data. In supervised learning, the algorithm is provided with input features and corresponding output labels, and it learns to generalize from this data to make predictions on new, unseen data.

There are two main types of supervised learning:

• **Regression**: Regression is a type of supervised learning where the algorithm learns to predict continuous values based on input features. The output labels in regression are continuous values, such as stock prices, and housing prices. The different regression algorithms in machine learning are: Linear Regression, Polynomial Regression, Ridge Regression, Decision Tree Regression, Random Forest Regression, Support Vector Regression, etc

• **Classification**: Classification is a type of supervised learning where the algorithm learns to assign input data to a specific category or class based on input features. The output labels in classification are discrete values. Classification algorithms can be binary, where the output is one of two possible classes, or multiclass, where the output can be one of several classes. The different Classification algorithms in machine learning are: Logistic Regression, Naive Bayes, Decision Tree, Support Vector Machine (SVM), KNearest Neighbors (KNN), etc.

2.Unsupervised Machine Learning: -

Unsupervised learning is a type of machine learning where the algorithm learnsto recognize patterns in data without being explicitly trained using labeled examples. The goal of unsupervised learning is to discover the underlying structure or distribution in the data. There are two main types of unsupervised learning:

• **Clustering**: Clustering algorithms group similar data points together based on their characteristics. The goal is to identify groups, or clusters,of data points that are similar to each other, while being distinct from other groups. Some popular clustering algorithms include K-means, Hierarchical clustering, and DBSCAN.

• **Dimensionality reduction**: Dimensionality reduction algorithms reduce the number of input variables in a dataset while preserving as much of the original information as possible. This is useful for reducing the complexity of a dataset and making it easier to visualize and analyze. Some popular dimensionality reduction algorithms include Principal Component Analysis (PCA), t-SNE, and Autoencoders.

3.Reinforcement Machine Learning: -

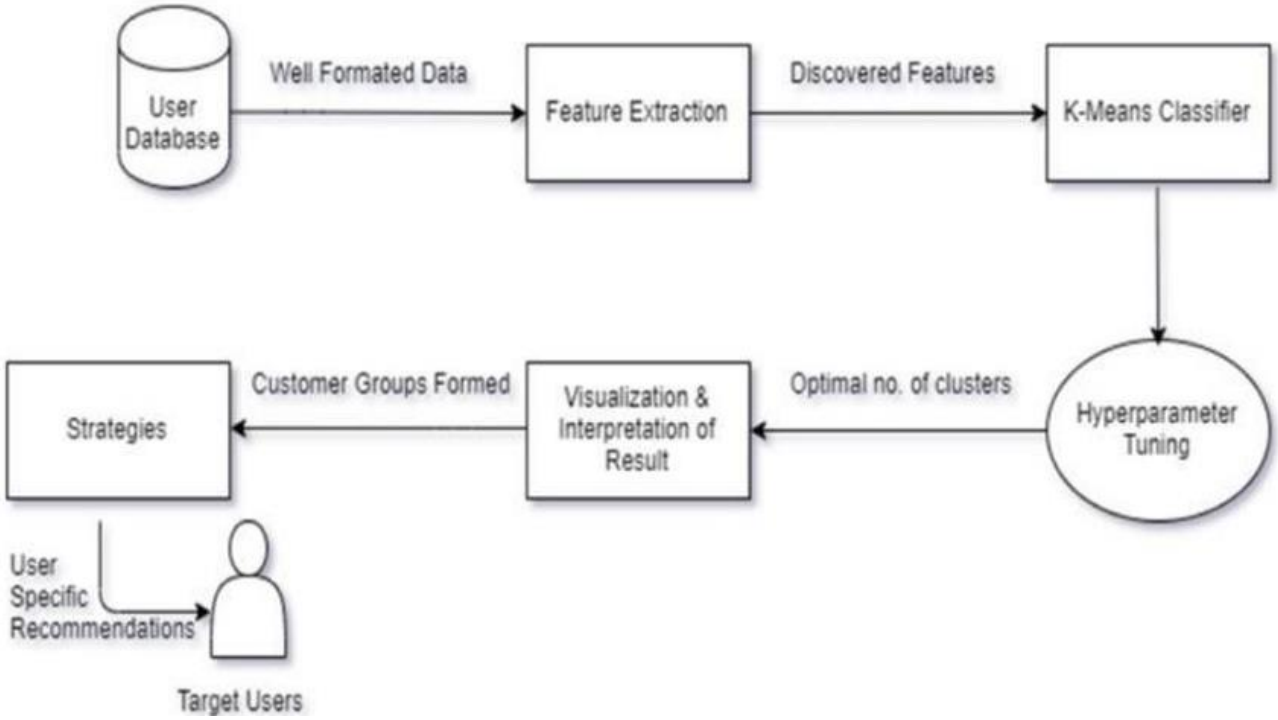
Reinforcement learning is a type of machine learning where an agent learns to interact with an environment by performing actions and receiving rewards or penalties based on its actions. The goal of reinforcement learning is to learn a policy, which is a mapping from states to actions, that maximizes the expected cumulative reward over time.

There are two main types of reinforcement learning:

Model-based reinforcement learning: In model-based reinforcement learning, the agent learns a model of the environment, including the transition probabilities between states and the rewards associated with each state-action pair. The agent then uses this model to plan its actions in order to maximize its expected reward. Some popular model-based reinforcement learning algorithms include Value Iteration and Policy Iteration.

Model-free reinforcement learning: In model-free reinforcement learning, the agent learns a policy directly from experience without explicitly building a model of the environment. The agent interacts with the environment and updates its policy based on the rewards it receives. Some popular model-free reinforcement learning algorithms include Q- Learning, SARSA, and Deep Reinforcement Learning.

Data Visualization: - With the formed clusters marketing team can make different strategies for better targeting customers.



5. FINDINGS

47% of the policyholders are looking for car insurance which constitute a major part of motor insurance. Whereas percentage of policyholders availing bike and commercial vehicle insurance is comparatively less which is 20%and 33% respectively

Due to technological enhancement, number of respondents going for online method while availing for a policy is more as compared to the traditional approach. 60% of the respondents buy motor insurance policies online. Still 40% of the crowd are comfortable with the traditional approach as they might not be familiar with the technology and any have some trust issues with the security of online process.

Major portion is acquired by Bajaj Allianz as it is the most leading general insurance company in India. 36% of the policyholders go with Bajaj Allianz. 26% of the policyholders choose Go Digit while availing for motor insurance in India. New India Assurance and Oriental company together constitute 31%. HDFC Ergo is on the least with 7% of the respondents availing it. Thus we can say that nowadays people are moving more towards private insurers as compared to govt. insurance companies.

69% of the respondents are completely satisfied with the services provided by their insurance providers whereas 24% of them are somewhere satisfied. Only 7% of them are not satisfied. This ensures that motor insurance companies are still at a developing stage in India.

Only 10% of the policyholders think that their insurers are lacking behind at providing proper financial assistance, else 90% of them feel satisfied with the financial assistance provided to them at the time of misha.

75% of the policyholders have never been in any such situation rather they were given proper financial assistance and also accurate claim amount. 8% of them were not satisfied with the claim procedure and the amount they receivedand 17% of the respondents don‟t know anything about the same.

6. CONCLUSION

Demand in the motor market is growing at steady rate. More and more automobiles will hit the Indian roads, so the growth is assured. Product innovations and price differentiation will matter but not in immediatefuture till the portfolio remains in the tariff regime. Here I can conclude that

- The operations of vehicle motor insurance in India is simple but not easy. The Indian insurance industry cannot continue its old practices in the motor-portfolio on which it has been operating since the nineties. Insurers in India have to keep pace with the changing times and innovations
- The role played by IRDA (Insurance Regulatory Development Agency) is to promote the policyholders' interest and educate everyone about buying insurance, boosting the growth of the insurance sector.
- There are a number of insurance providers in India who offer various types of vehicle insurance policy to suit the varying needs of individuals. It is always advisable to do an online comparison of the premiums and benefits that are being offered by different insurance providers before buying a policy, One must compare and choose the best vehicle insurance policy.

Buying an insurance policy, besides addressing your personal security, is also a social responsibility as insurance, as a concept is successful, only if there is mass participation.

7. REFERENCE

Policyholder's Information: Include the full name, address, contact information, and policy number of the insured individual or entity.

Vehicle Information: Provide details about the insured vehicle, such as the make, model, year, vehicle identification number (VIN), license plate number, and any modifications.

Coverage Details: Specify the type of coverage included in the insurance policy, such as liability, collision, comprehensive, uninsured/underinsured motorist, personal injury protection (PIP), and any additional riders or endorsements.

Insurance Company: Mention the name and contact information of the insurance company providing the coverage.

Effective Dates: State the start and end dates of the insurance coverage period. **Premiums and Deductibles:** Include information about the premium amount, payment schedule, and deductible amounts for different types of coverage.

Terms and Conditions: Highlight any specific terms, conditions, limitations, or exclusions associated with the insurance policy.

Declaration Page: The declaration page is a summary of the insurance policy that typically includes all the key information mentioned above in a concise format.