

LIFE INSURANCE PREDICTION

DEPARTMENT OF COMPUTER SCIENCE WITH ARTIFICIAL
INTELLIGENCE

PROJECT REPORT
ON
LIFE INSURANCE PREDICTION



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Life Insurance Predication

ABSTRACT:

This project aims to implement a predictive model that determines life insurance eligibility and suggests suitable policy types. By analyzing personal and lifestyle factors, the model enhances the efficiency of the insurance application process and assists both providers and customers in decision-making.

Introduction:

Life insurance is a crucial financial product that provides financial security to policyholders' families. Insurance companies face challenges in identifying potential customers who are likely to purchase a life insurance policy. Traditional marketing strategies often lead to inefficiencies, with companies targeting a large audience without certainty about their interest in purchasing a policy.

With advancements in machine learning (ML) and data analytics, predictive models can analyse customer demographics, financial status, health conditions, and behavioural patterns to identify high-potential buyers.

Problem statement:

Insurance companies need a predictive model that can analyse customer data and predict whether an individual is likely to purchase life insurance. This will help in:

- Improving customer targeting for marketing campaigns.
- Enhancing conversion rates by focusing on potential buyers.
- Optimizing business strategies for insurance companies.

The challenge is to build a highly accurate and interpretable machine learning model that can classify customers based on their likelihood of purchasing a life insurance policy.

Objectives:

1. Develop a predictive model for life insurance purchase classification.
2. Identify key factors influencing customer decisions.
3. Improve marketing strategies using data-driven insights.
4. Deploy the model for real-time customer analysis

Scope of the Project:

- Input: Customer data including demographics, financial details, health history, and previous insurance records.
- Output: a. Probability of whether the customer will purchase life insurance.
b. Predicting what type of Insurance the user will get.

Tools Used:

- Programming: HTML, CSS, Python
- Libraries: Pandas, NumPy, Scikit-learn, Flask
- Deployment: Cloud-based APIs or Web Applications.
- Algorithm: Decision Tree Classifier

- *Dataset Extraction:*

Data Sources:

The dataset can be obtained from:

- Public sources like Kaggle, UCI Machine Learning Repository.
- Private datasets from insurance companies (if available).

Data Attributes:

<i>Feature Name - Description</i>	
Age	- The age of the customer
Gender	- Male/Female/Other
Marital Status	- Single, Married, Divorced
Income	- Annual income of the customer
Existing Policies	- Number of active insurance policies
Health Status	- Any existing health conditions
Family History	- Medical history of family members
Claim History	- Number of past insurance claims

Model Training and Evaluation:

Performance Metrics Used:

- ❖ Accuracy – Measures overall correctness.
- ❖ Precision & Recall – Balances false positives and false negatives.
- ❖ F1-score – Harmonic mean of precision and recall.

Model Results:

- ✓ Accuracy: ~85% (Varies based on dataset).

Integration and Deployment:

Deployment Strategy:

1. Convert the model into an API using Flask/FastAPI.
2. Deploy on cloud platforms like AWS, Azure, or Google Cloud.
3. Connect the API to insurance CRM systems for real-time predictions.

Real-world Use Cases:

- Sales teams use the model to identify high-potential leads.
- Automated insurance chatbots recommend policies based on predictions.
- Marketing teams target customers with personalized offers

Final Review and Future Scope:

Key Takeaways:

- Built a machine learning model to predict life insurance purchases.
- Identified key features influencing customer decisions.
- Integrated the model with real-world applications for business use.

Future Improvements:

- Improve accuracy by incorporating real-time behavioural data.
- Deploy a cloud-based system for large-scale processing.
- Implement a feedback loop for continuous model learning.

Conclusion:

This project successfully demonstrates how machine learning can help insurance companies predict potential buyers, optimize marketing efforts, and increase policy sales. By leveraging data-driven insights, businesses can improve customer targeting and enhance overall operational efficiency.