

LifeSure Dashboard Specifications Document

1. Project Goals

1.1 Overall Purpose

LifeSure dashboard is designed to analyze how demographic and environmental factors influence health insurance premiums. The objective is to identify key trends that will enable LifeSure to optimize pricing strategies, improve customer satisfaction, and create innovative insurance policies. With data-driven insights, LifeSure can make decisions that maximize the viability of its policies and the well-being of its policyholders.

1.2 Key Metrics and Insights

The key drivers we would like to track in our dashboard are important to analyze the different types of insurance.

We can see how the level of air pollution is associated with health insurance spending to understand the impact of environmental factors on healthcare spending.

But also the impact of demographic factors such as age, gender and smoking on healthcare spending.

Finally, insurance price regional differences and how this relates to air quality will be used to enhance location-based price models.

1.3 Addressing LifeSure's Needs

1.3.1 Sustainability

The dashboard will help one establish the impact of air pollution on the health of LifeSure policyholders by examining the pollution index in different regions and how it impacts insurance premiums. Determining vulnerable regions will allow one to enact essential environmental policies that can reduce healthcare costs.

With visualizations showing the history of the pollution index and how it relates to the average cost of insurance per region, LifeSure will be able to re-tailor its proposals and provide incentives to encourage more sustainable behavior.

1.3.2 Customer Satisfaction

The dashboard will provide a comprehensive view of customer satisfaction via statistical insights and interactive visualization. It will enable segmentation of LifeSure's policyholders by geography, smoking status, and age, allowing customized insurance propositions to each group based on their specific needs.

By identifying high-risk segments, LifeSure will be able to offer preventive interventions that will allow clients to reduce healthcare expenditure. Tracking customer satisfaction levels and key drivers of cost will improve retention as well as user experience.

1.3.3 Policy Innovation

The insights gained from the dashboard will allow LifeSure to refine its pricing strategies and offer discounting for healthy behaviors such as non-smoking or living in low-pollution areas. Secondly, LifeSure will be able to launch specific preventive campaigns in accordance with environmental and health risk assessments. This will allow LifeSure to develop more personalized, proactive insurance products, reducing healthcare costs while maximizing overall health outcomes.

2. Functional Requirements

2.1 Dashboard Features

LifeSure's dashboard will provide various interactive visualisations to help determine the types of insurance and their premiums.

It will allow data to be filtered and customized according to different criteria.

The dashboard needs to be able to provide a number of visualisations in a bid to give the best coverage and lowest rates, therefore we've thought about including these:

- Trend lines: These allow users to view trends in the levels of insurance premium and pollution over time.
- Bar charts: Compare medical expenses by age range, number of children and state.
- Scatter plots: Investigation of the relationships between levels of pollution and health insurance costs.
- Box plots: Plotting of medical costs as a function of smoking status, BMI and AQI (air quality index).
- Heat maps: Visualization of correlation matrices between numerical and categorical variables to detect strong correlations.

2.2 Data Sources

The LifeSure dashboard is based on two data sets to investigate the impact of environmental variables on health insurance costs:

Medical Cost Data: Age, sex, BMI, number of dependents, smoker status, region, and individual medical charges from the Medical Cost Personal Datasets.

Air Quality Data: Collected by the U.S. Environmental Protection Agency (EPA), includes Air Quality Index (AQI) values and geographic location from over 200 monitoring sites.

By merging these datasets, the dashboard exposes relationships between the levels of pollution and medical costs, allowing LifeSure to refine pricing strategies and risk assessments.

2.3 Interactive Features

To further enhance the experience, the dashboard could include interactive features such as customer segmentation filters (geographical area, smoking status, age group), or time selection filters to analyze trends for a specific time period.

It could also include comparison features to compare various demographic and environmental factors, and data export functionality to enable further offline analysis.

3. Dashboard Design Recommendations

The LifeSure dashboard should be clear to read, intuitive, and visually engaging, enabling instant interpretation of major findings.

3.1 Layout & Information Hierarchy

For optimal visualisation and ease of understanding, the dashboard should have a coherent layout, with the most important indicators in the top part and detailed analyses in the bottom part.

The top section should therefore have: Title, filters (smoking, age, region, time of day) and key performance indicators (cost of insurance per region, pollution index, customer satisfaction).

Then in the middle section we could have trend lines, bar charts, box plots and heat maps to show differences in costs and impacts on the environment.

Finally, on the bottom portion we would have in-depth data, interactive functions and export options.

3.2 Color Scheme & Readability

A clean and professional color scheme should be used to promote readability and interpretation of the data.

Green and blue colors are used for favorable trends (low cost, good air).

Orange/red colors are used for risk factors (high insurance costs, bad air).

A neutral background color and readable fonts must be used for better readability.

3.3 Accessibility & User Experience

The dashboard will be designed with desktop, tablet, and mobile responsiveness to ensure smooth usage across devices. It will support high contrast and tooltips for accessibility, dynamic filtering and drill-down for deeper insights, and export functionality for offline analysis.