

San Francisco Business Survival Dashboard — Product Design & User Insights

Project Presented by,
- Abirami Rajamanickam

Executive Summary

- This interactive dashboard explores San Francisco business survival patterns using survival analysis and dynamic visualizations, with a focus on actionable insights for product designers and managers.
- The project aims to bridge data-driven business survival trends with strategic UI/UX design interventions that can support local businesses' longevity.

Purpose and Product Focus

Understanding how long businesses survive in different neighborhoods and license categories helps product and design teams:

- **Identify User Needs and Pain Points**
Recognize which business segments face challenges during different lifecycle stages to inform user-centered design solutions.
- **Inform Product Development Priorities**
Prioritize features, onboarding flows, and support mechanisms for products or services targeting vulnerable business categories.
- **Visualize Business Health with Dynamic Charts**
Leverage bar charts with color coding to depict lifespan distributions, enhancing comprehension and decision-making.
- **Incorporate Design Proposals**
Enable uploading and showcasing UI/UX mockups directly in the app, facilitating collaboration between data teams and design stakeholders.

Data Collection — Foundation for Informed Design

Source: San Francisco Open Data API, focused on business registrations

Purpose: Gather reliable data on business lifespans and closures within District 3

Process:

- Automated, clean extraction with error handling to ensure data quality
- Filtered for relevant licenses and neighborhoods

Why It Matters for Designers:

Understanding the business context and environment enables design solutions tailored to real-world user needs and challenges

Modeling Approach — Informing Design Strategy

Objective: Predict business closure risks to identify critical intervention points

Method: Survival Analysis using Cox Proportional Hazards

Why Product Designers Care:

- Reveals when and why businesses might fail — insights that can guide UX flows and support features
- Highlights specific business segments and neighborhoods for targeted product solutions

Advanced Techniques:

- PCA for feature reduction, improving model clarity
- Data-driven approach to prioritize design efforts where impact is greatest

Survival Analysis Insights — Driving User-Centered Solutions

Findings:

- Younger businesses and specific neighborhoods are more vulnerable
- Tax policies and business types strongly influence survival rates

Design Implications:

- Tailor onboarding and retention experiences to business lifecycle stages
- Create localized support tools addressing neighborhood-specific risks
- Inform product managers on prioritizing features and resources

Impact:

Enables data-informed design decisions that support sustainable business growth and community resilience

Key Features

Dynamic Filtering by license type and neighborhood for granular analysis

Business Lifespan Distribution displayed as a color-coded bar chart instead of survival curves for more intuitive insights

Customizable Visuals with annotations and font adjustments for clarity

UI/UX Mockup Uploaders for embedding design concepts related to business survival insights

Product Design Opportunities section providing actionable recommendations for product managers and designers based on data trends

Data Overview

The underlying data consists of cleaned San Francisco business registration records, including:

- License type and neighborhood information
- Business start and end dates with duration calculation
- Event indicator for business closures

Technical Stack

- Python with **Streamlit** for the interactive web app
- **Pandas** for data processing
- **Matplotlib** for visualizations
- Survival analysis using the **lifelines** library

How to Use

- Select a **license type** and **neighborhood** via the sidebar filters.
- View the **business lifespan distribution** as a color-coded bar chart.
- Upload your **UI/UX mockups** (web and mobile) directly into the app to relate design ideas to data insights.
- Review **design opportunities and recommendations** tailored for product teams to support business survival.

Product Design Insights & Recommendations

Based on the visualized data and survival trends, product designers and managers should consider:

- Prioritizing **onboarding and support flows** for businesses in early lifecycle stages.
- Designing **location-aware features** tailored to neighborhood-specific challenges.
- Using **data-driven communication strategies** to engage businesses at critical survival periods.
- Incorporating **feedback loops** from uploaded UI/UX mockups to iteratively refine solutions.

Future Directions

- Integrate **real-time business health metrics** to update visualizations dynamically.
- Enhance mockup upload functionality to support **interactive prototypes**.
- Incorporate user behavior analytics to complement survival data for holistic product design insights.
- Explore embedding **AI-powered summarization** of business trends and design feedback within the app.

Streamlit Application Demo

Thank you!