

CASE STUDY

InformaticTech Provides A Robust Pattern Discovery and Analysis of Clinical Safety Programs



Client Overview

The client needed help in assessing the safety and tolerability of their programs using pattern discovery and analysis of patient data sets that share some features and occur frequently together or are strongly correlated in the data set.

≡ The Challenges

The client's main challenge was to obtain insightful patterns for the given variables:

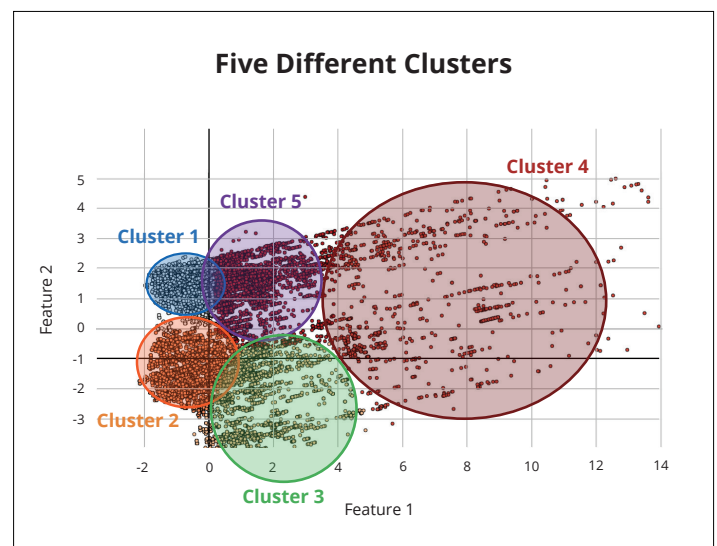
- ≡ AE and SAE variables
- ≡ Lab test variables
- ≡ Disease diagnosis variable
- ≡ Diagnostic and treatment procedures
- ≡ Demographic variables

The pattern discovery should determine the safety and tolerability of the two programs mainly Program-1 administered alone and in combination with Program-2 in subjects with advanced solid tumors.

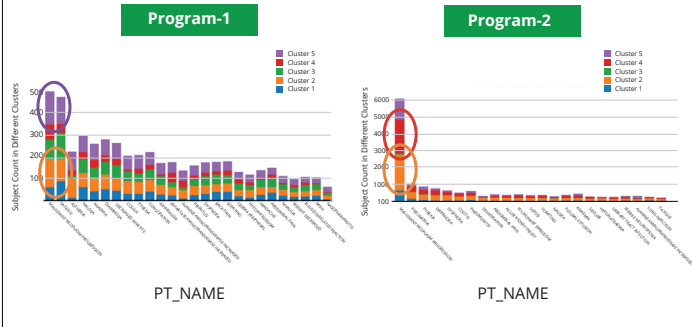
≡ The Solution

The InformaticTech team implemented two techniques for discovering patterns: Principle Component Analysis (PCA) and K-means Clustering.

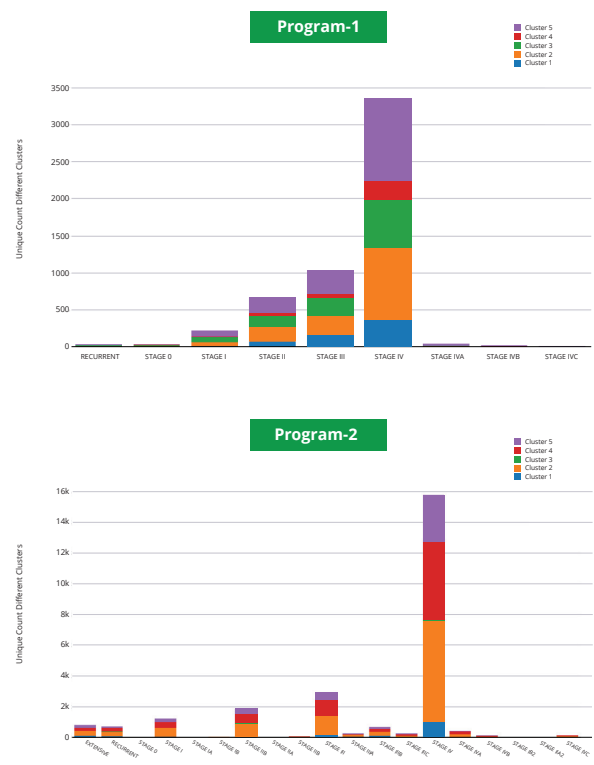
The team started with 41 features including AEs, lab test, disease diagnosis, diagnostic and treatment procedures, and the demographic variables. PCA was implemented to reduce dimensionality. Then, K-means Clustering was applied to group samples into five different clusters.



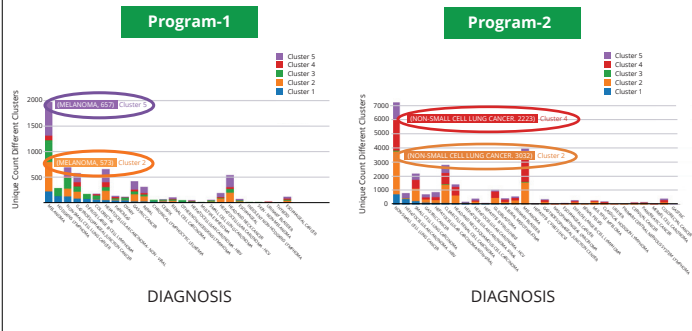
Distribution of AEs in 5 Different Clusters



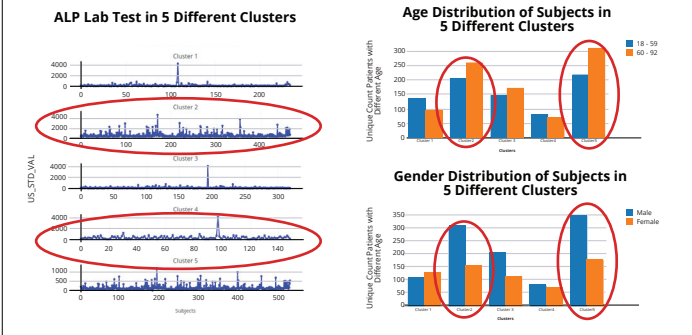
Distribution of AEs in 5 Different Clusters



Distribution of Disease Diagnosis in 5 Different Clusters



Analyzing lab & Demographic Variables (Program-1)



Analyzing lab & Demographic Variables (Program-2)



The pattern discovery and the succeeding analysis lead to the conclusion that liver metastasis was more likely to occur in patients with stage IV cancer and most seen in patients aged 60-90. Additionally, the team found a strong correlation between the metastasis and resistance to treatment.

Outcomes Delivered



Robust and valuable pattern discovery



Increased interpretability using PCA



Simpler implementation and scalability using K-means Clustering

