ISCA Membership Engagement Scoring Model

Project Objective

Predict the probability of a member resigning

Measure the engagement level of each member

Identify the factors that drive member engagement

Step 1: Data Cleaning

After cleaning the data, our team had the following variables:

Membership Data	Courses Data	Donations Data
Age, Class, Type, Specialisation, Job, Organisation, Subscription preferences	Difficulty, Type, Subject, CPE hours, Fees	Average annual contributions

Step 2: Unsupervised Learning

Perform **k-means clustering** to get 5 distinct subgroups with the following characteristics:

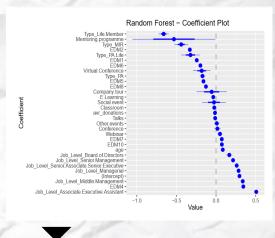| Cluster		Summarised Persona
1	Inactive	→ **Member Class:** Affiliate, Associates → **Job Level:** Middle Management → **Organisation:** MNC, Big 4 → **Courses and Donations:** Minimal, Corporate-level → **Course fees:** $0
2	Meeting the Bare Minimum	→ **Member Class:** Affiliate, Associates, Senior Associates → **Organisation:** LLEs, Academia, Government → **Courses and Donations:** Minimal, Corporate-level → **Course fees:** $200 yearly
3	*Networking Seekers*	→ *Member Class: CA* → *Organisation: SMEs, Government, Not for profit* → *Courses and Donations: Rather active, Individual-level* → *Course fees: $477 yearly*
4	Diligent Accountants	→ **Member Class:** CA → **Job Level:** Managerial, Senior Management → **Organisation:** SMEs, Not for profit, Academia → **Courses and Donations:** Active, Individual-level → **Course fees:** $800 yearly
5	Enthusiasts	→ **Job Level:** Senior positions → **Organisation:** Non-Big 4 → **Courses and Donations:** Very active, Individual-level → **Course fees:** $1400 yearly

Step 3: Supervised Learning (RF, C5.0) + Linear Regression

Prepare datasets using **oversampling, normalising,** and remove variables with **correlation plots.**

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Split into train and test, and predict how likely a member would resign (1 = resigned, 0 = current) using **Random Forest** and **C5.0.**

Note: cluster 3 was too small to be run

Random Forest – Coefficient Plot

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Derive engagement score using **linear regression.**

Final Dashboards:

Excel

Enter New Member's Data:

Category	Data type	Variable	Variable Value	Engagment Score
Course Hours and Fees	Enter Numerical Number (average per year)	Age Average Donations Average Course Fees	70 500 1000	101 181 271
Membership Type	Select one:	Life Member Member in Retirement (MIR) Public Accountant (PA) Public Account Life Member (PA Life)	Member in Retirement (MIR)	44
Job Level	Select one:	Associate / Executive / Assistant Board of Directors Managerial Middle Management Senior Associate / Senior Executive Senior Management	Board of Directors	34
EDM	Enter 1 for subscribe, 0 for does not subscribe	Conferences and Networking Events Continuing Professional Development (CPD) Courses Courses and Events Insights for Professional Accountants in Business Insights for Professional Accountants in Business & Practice Insights for Professional Accountants in Practice IS Chartered Accountant Journal Small and Medium-sized Practices (SMP) Bulletin	1 1 1	0 43 0 0 39 0 38 0
		Total Engagement Score:		752