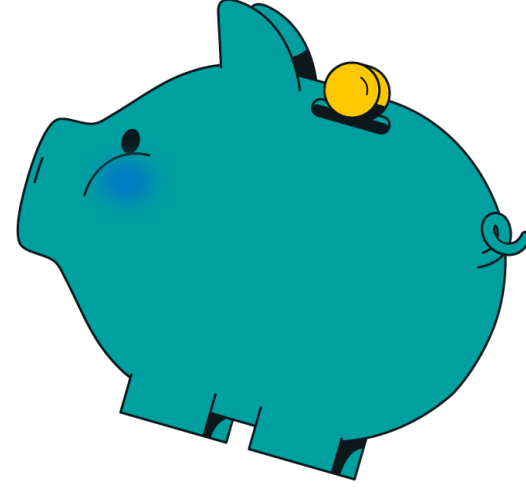


Digital Accounts



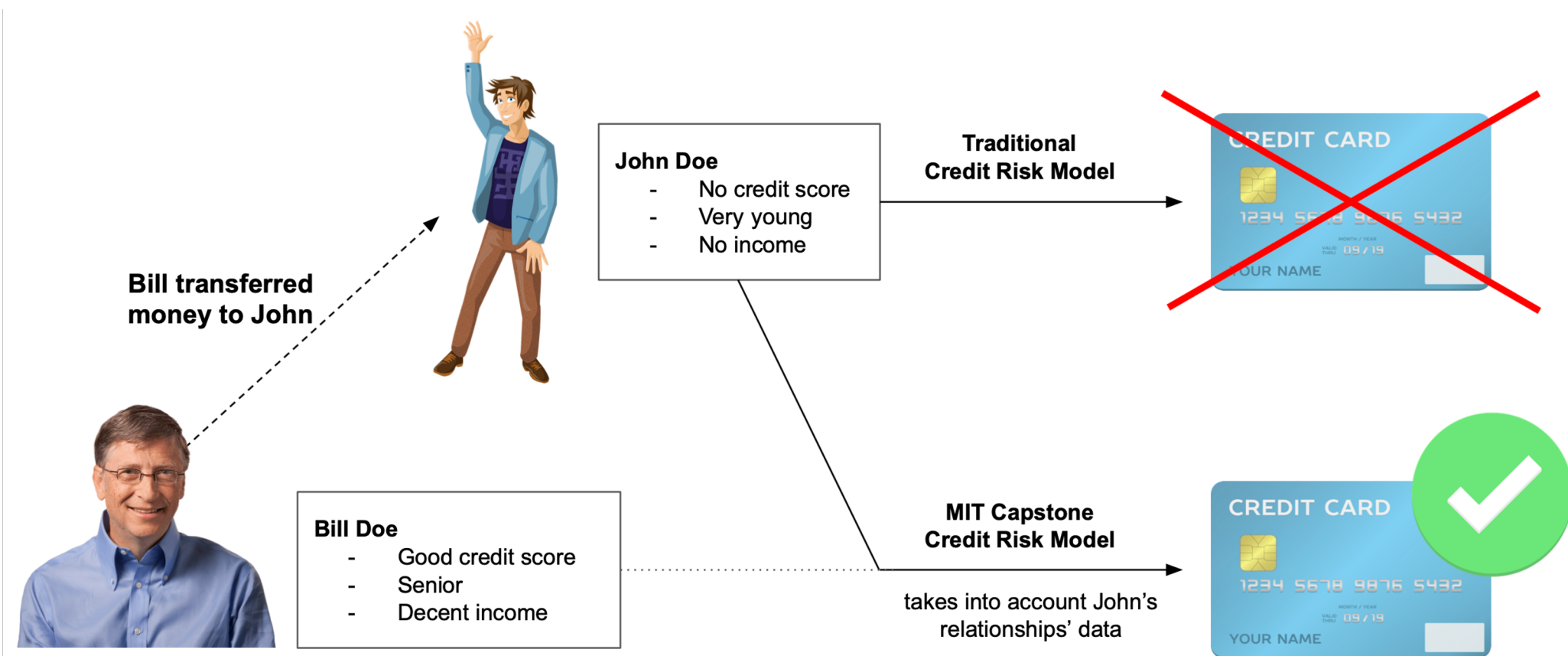
Credit Cards



Savings Accounts

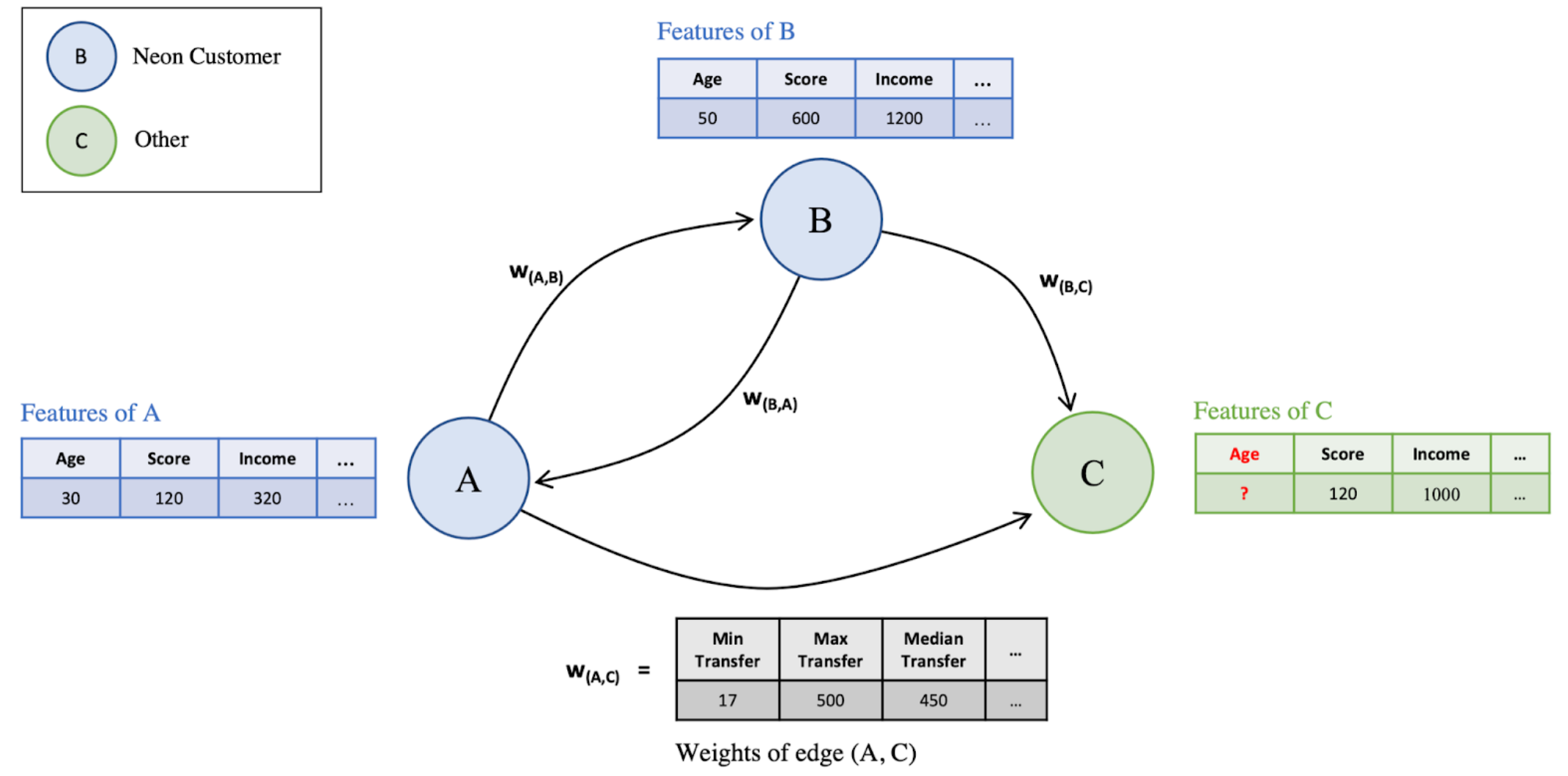
Socio-Demographic	Account Balance	Transactions
Features Credit score, Income, Age...	Features Monthly aggregated data on Checking & Savings	Features Monthly aggregated data on different types of transaction
Rationale Socio-Demographic data is a good indicator of financial stability	Rationale Money on accounts can be used to pay off credit card debt	Rationale Customer spendings behavior provides information about financial well-being

Neon is a Brazilian Fin-Tech leader offering retail banking services

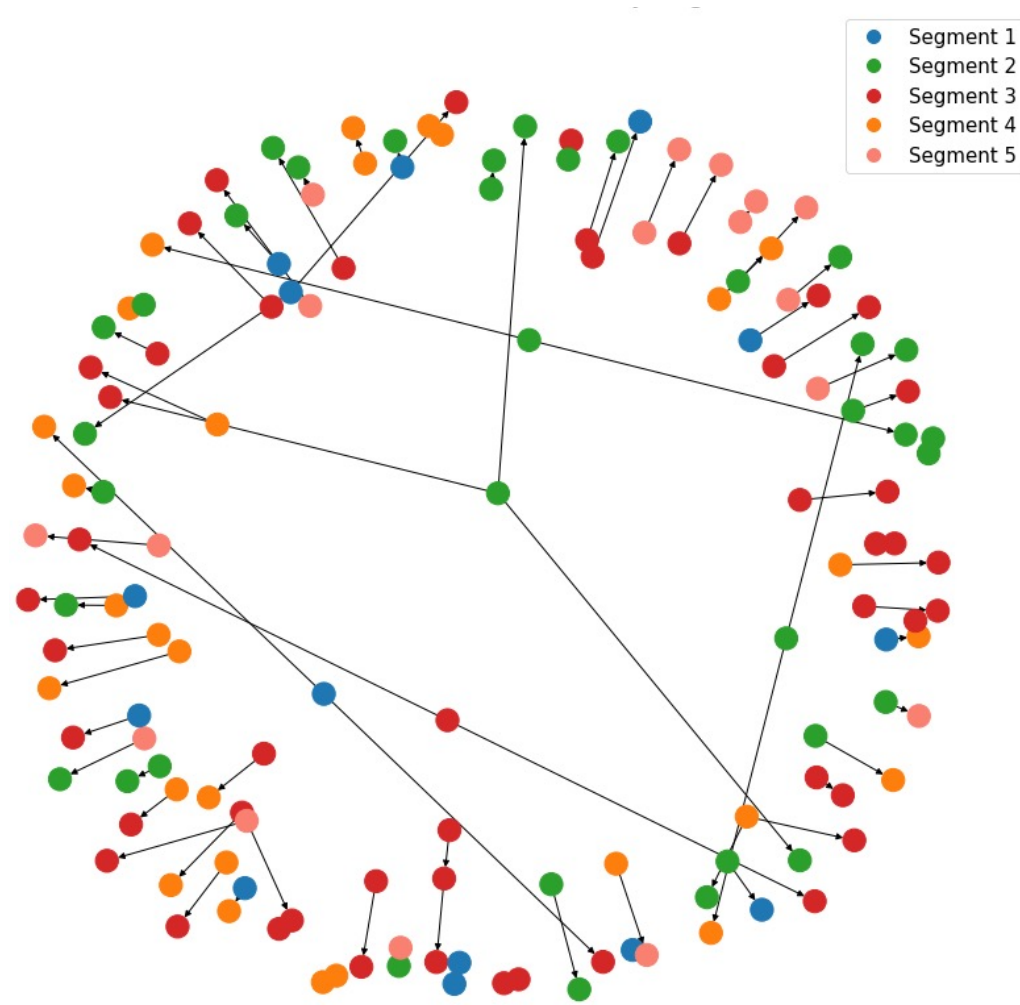


How can we use relationship's data to improve credit risk models?

How traditional credit default models work

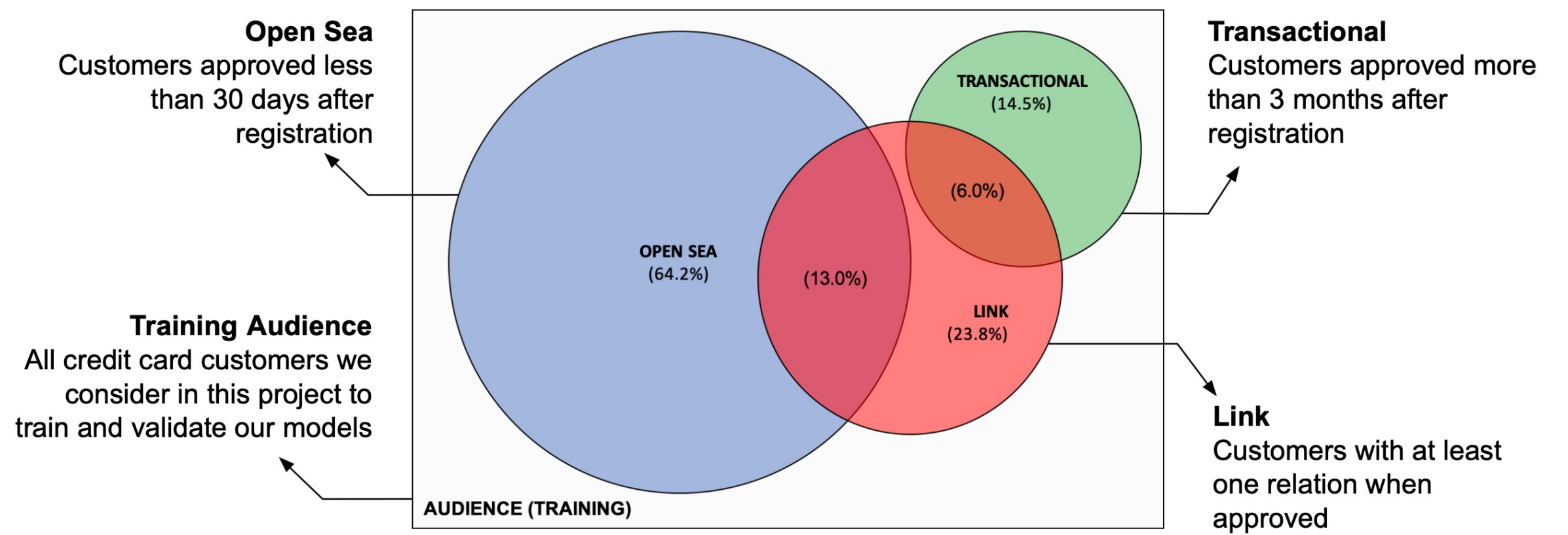


Design of a Relationship Network using transfers and invitations

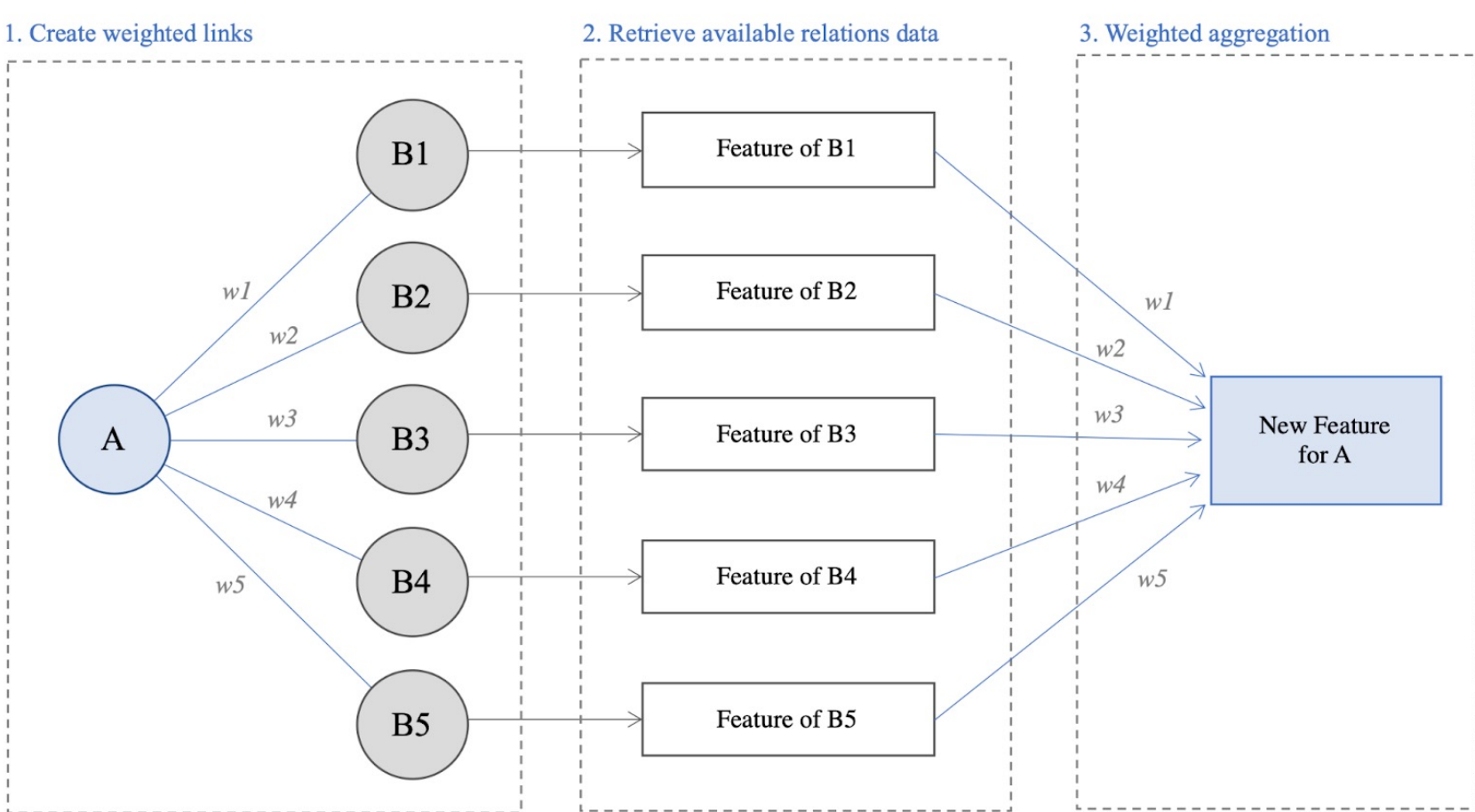


Network's subgraph coloring nodes by their customer segment

Connected customers are 64% more likely to share the same segment than for random customers

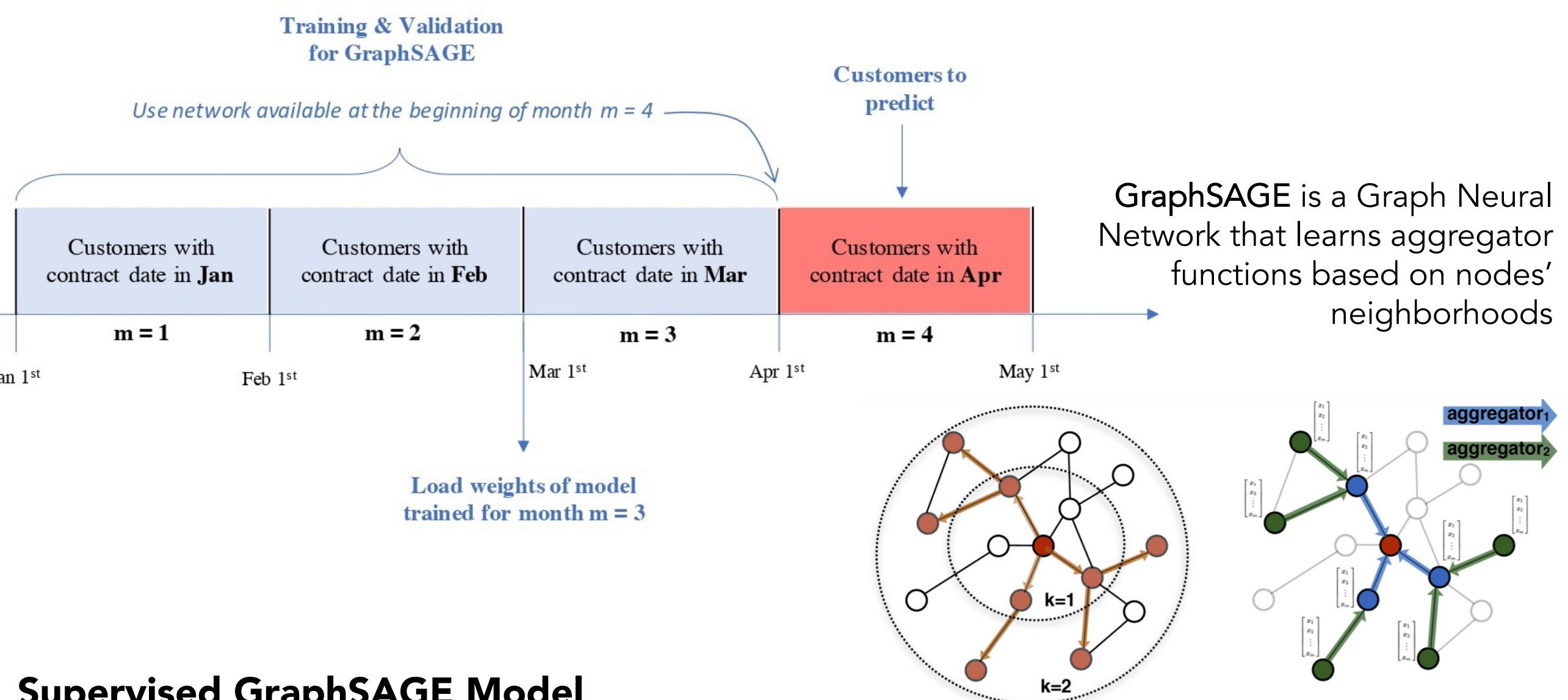


Four populations on which we evaluate our models



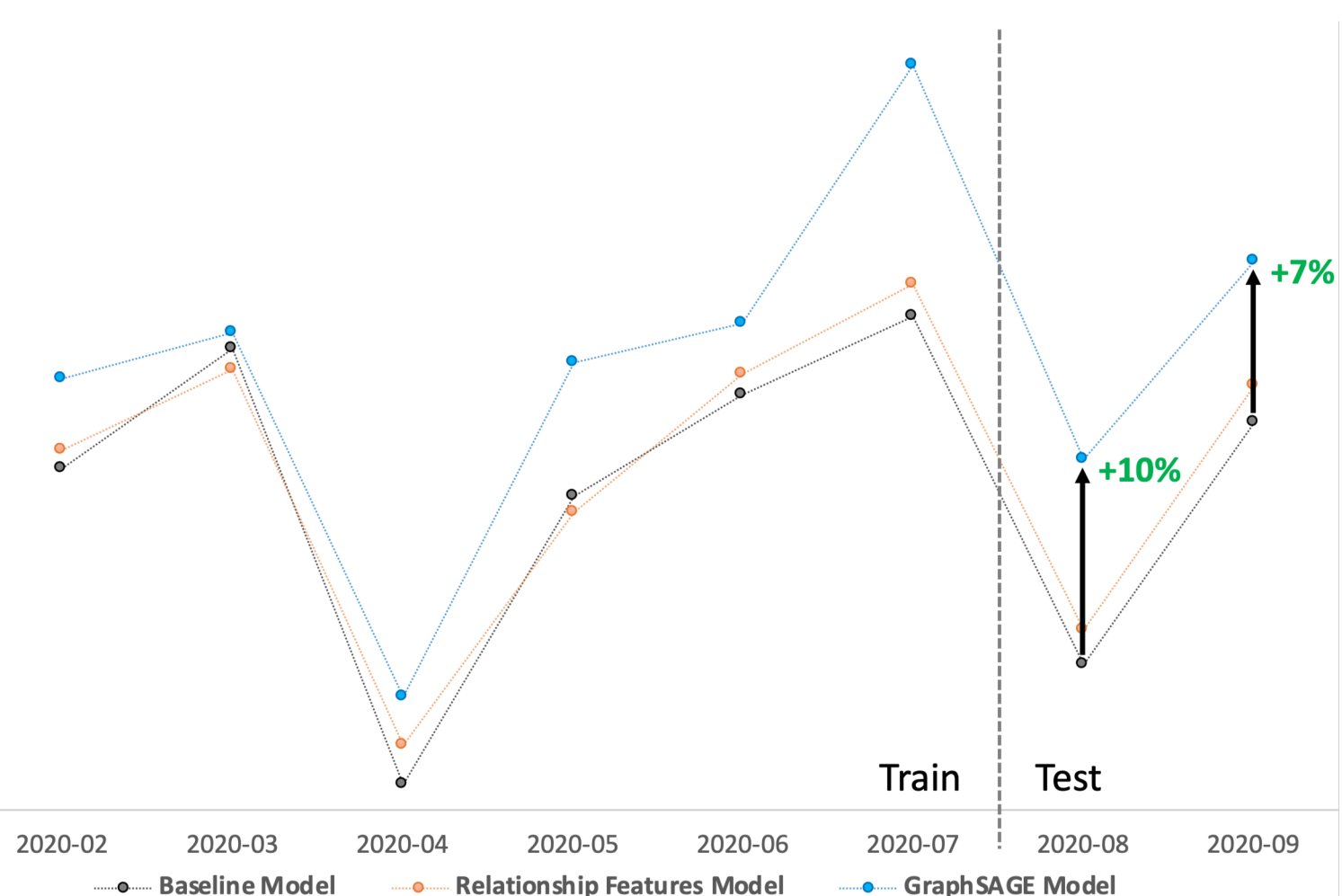
Relationship Features Model

Relationship's data is aggregated into new features fed to an XGBoost model

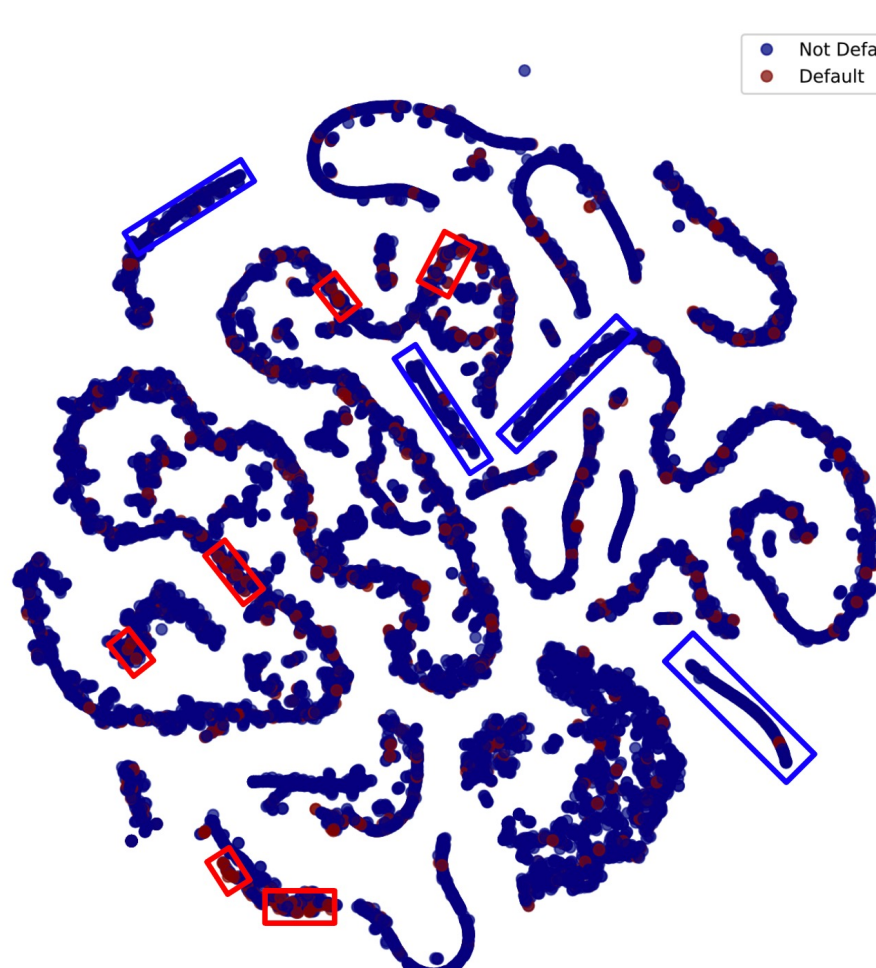


Supervised GraphSAGE Model

A deep learning model on graphs generates node embeddings that are fed to an XGBoost model



Monthly evolution of our KPI on the OpenSea population



Population	Audience	OpenSea	Transactional	Link
Model				
Relationship Features	+0.3%	+1.4%	-1.6%	+4.4%
Supervised GraphSAGE	+2.4%	+3.6%	-0.4%	+9.2%

On the OpenSea population, relational models add more signal than noise.

Business Impact

- Increase credit card approvals, hence profit
- Decrease costly customer churn for customers rejected at registration
- Reduce to 30 from 90 days credit limit reassessment for customers approved at registration