

# Customer Behavior & Usage Segmentation

ConnectaTel · Python/Pandas Analysis Project, 2026

Exploratory analysis of customer behavior for ConnectaTel, a telecommunications company operating in Latin America. Cleaned and merged three datasets (plans, users, usage) covering 4,000 customers and 40,000 usage records, built a per-user consumption profile, resolved data-quality issues, and segmented customers by usage intensity and age to surface retention and upsell opportunities.

## Business Question

Which customers drive the most value for ConnectaTel, and how should the company adjust its plans and retention strategy to match actual usage behavior?

## Methodology

- 1. Data quality diagnosis: nulls, sentinel values (age = -999, city = '?'), and impossible dates (40 records dated 2026).
- 2. Cleaning: replaced sentinels, standardized dates, confirmed duration/length nulls are Missing At Random by usage type.
- 3. Feature engineering: aggregated 40,000 usage records into a per-user profile (messages, calls, call minutes).
- 4. Outlier analysis (IQR & Z-score) and rule-based segmentation by usage intensity and age.

```
# Usage segmentation rule (pandas)
def usage_segment(row):
    if row.calls < 5 and row.messages < 5:
        return 'Low use'
    elif row.calls < 10 and row.messages < 10:
        return 'Medium use'
    else:
        return 'High use'

profile['usage_segment'] = profile.apply(usage_segment, axis=1)
```

Segmentation logic sample: age segments (Young adult / Adult / Senior adult) follow the same rule-based pattern.

## Key Finding (Context → Finding → Implication)

### Context

ConnectaTel wanted to know whether its Basico/Premium plan structure matches real usage behavior.

### Finding

Medium use is the largest segment (2,943 of 4,000 customers); Basico dominates every usage and age segment, including the heaviest users (185 of 278 High-use customers).

### Implication

Target Medium-use customers for Premium upgrades; design an upsell tier for the 21-47 power users per metric currently under-monetized on Basico.

## Visualization



