Evercrest Services Group

2026 Employee Pulse Study

Statistical Analysis & Technical Appendix

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Synthetic Dataset

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2026 Employee Pulse Study — Technical Appendix

A. Dataset and Analytical Approach

This independent portfolio project used a synthetic longitudinal employee pulse survey dataset representing three survey waves in February, June, and October 2026.

Each wave had 650 eligible employees. The dataset contained 1,560 submitted survey responses from 641 unique respondents.

Wave	Responses	Participation Rate
February (W1)	556	85.54%
June (W2)	521	80.15%
October (W3)	483	74.31%
Total	1,560	80.00%

Respondent participation varied: 58 employees completed one wave, 247 completed two waves, and 336 completed all three waves. Three-wave panel retention was 60.43% of initial-wave respondents.

The survey included individual five-point items measuring Manager Support, Workload Manageability, Leadership Trust, Career Growth, Recognition, Psychological Safety, Engagement, and Intent to Stay.

Analyses were performed in jamovi and R. Power BI was used for descriptive reporting and dashboard development.

B. Leadership Trust Across Survey Waves

Research question: Did Leadership Trust change across the three survey waves?

Wave-level descriptive statistics were:

Wave	Valid N	Mean	SD
W1	545	3.35	0.860
W2	508	3.26	0.779
W3	474	3.11	0.848

The descriptive means include available responses within each wave. The inferential analysis used matched respondents with complete Leadership Trust observations across the three waves.

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A Friedman test was selected to evaluate within-person differences across the repeated ordinal measurements.

Result: $\chi^2(2) = 9.80$, $p = .008$.

Holm-adjusted pairwise comparisons:

Comparison	Adjusted p	Interpretation
W1 vs. W2	.198	Not significant
W2 vs. W3	.198	Not significant
W1 vs. W3	.003	Significant

The findings support a statistically significant change across the study period, with the first-to-final-wave comparison accounting for the clearest difference. The results do not identify the cause of the decline.

C. Higher-Pressure Department Comparisons

Research question: Did employees in Operations and Customer Services report less favorable experiences than employees in other departments?

Operations and Customer Services were classified as the higher-pressure group. Other departments formed the comparison group.

To avoid treating repeated survey submissions as independent employees, available responses were aggregated to employee-level averages before testing. The groups comprised 338 and 303 unique employees, respectively, although valid sample sizes varied slightly by measure.

Outcome	Higher-Pressure Mean	Other Mean	Unadjusted p	Holm-Adjusted p	Rank-Biserial r
Workload Manageability	2.714	2.952	~.0000001	~.0000003	−.231
Engagement	4.327	4.443	.002959	.002959	−.124
Leadership Trust	3.168	3.333	.000063	.000126	−.173

One-sided Wilcoxon rank-sum tests evaluated the prespecified direction that higher-pressure departments would report lower scores. Holm adjustment addressed multiple comparisons.

All three group differences remained statistically significant after correction. Workload Manageability had the largest observed group effect.

These tests concern aggregated employee-level group differences, not independently tested differences within each individual survey wave.

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D. Career Growth and Intent to Stay

Research question: Was Career Growth positively associated with Intent to Stay?

Spearman's rank correlation was used to assess the association between the two ordinal survey items.

Result: $\rho = .3023$, $p < .001$ (one-sided positive-direction test).

The result indicates a moderate positive association: more favorable Career Growth perceptions tended to accompany stronger Intent to Stay scores. The analysis does not establish a causal relationship.

E. Multiple Regression: Intent to Stay

Research question: Were Workload Manageability, Career Growth, and Leadership Trust each associated with Intent to Stay when considered simultaneously?

The analysis was restricted to complete Wave 3 observations (N = 455).

- **Dependent variable:** Intent to Stay
- **Predictors:** Workload Manageability, Career Growth, Leadership Trust
- **Method:** Multiple linear regression

Overall model results:

Statistic	Result
N	455
R	.504
R^2	.254
Adjusted R^2	.249
F(3, 451)	51.3
Model p-value	< .001

Regression coefficients:

Predictor	B	SE	Standardized β	t	p
Workload Manageability	.293	.0429	.282	6.82	< .001
Career Growth	.311	.0452	.281	6.87	< .001
Leadership Trust	.248	.0454	.226	5.46	< .001

All three predictors demonstrated statistically significant positive associations with Intent to Stay, controlling for the other included predictors.

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The model accounted for 25.4% of the observed variance. The standardized coefficients for Workload Manageability and Career Growth were nearly identical; their small numerical difference should not be interpreted as a meaningful difference in importance.

Diagnostics and interpretation

- Variance inflation factors ranged from approximately 1.01 to 1.04, indicating no apparent multicollinearity concern.
- The Shapiro–Wilk test of residuals was not statistically significant (W = .996, p = .299).
- The residual Q–Q plot showed minor tail deviations.
- Residual-versus-fitted plots displayed diagonal banding consistent with the discrete five-point dependent variable, limiting interpretation of the usual continuous-outcome diagnostic patterns.
- Maximum Cook's distance was approximately .0391, below 1, although observations exceeding the common 4/N screening threshold merit inspection rather than automatic exclusion.

The linear model was used as an exploratory, interpretable assessment of associations. Its results should not be presented as causal effects or as predictions of observed turnover.

F. Departmental Engagement: Welch ANOVA

Research question: Did Wave 3 Engagement scores differ across the six individual departments?

The analysis used available Wave 3 Engagement observations (N = 476).

Department	N	Mean Engagement	SD
Administration	36	4.33	.793
Customer Services	119	4.29	.705
Finance	60	4.37	.780
Human Resources	49	4.35	.879
Operations	123	4.23	.787
Technology	89	4.40	.686

Levene's test did not identify significant differences in departmental variances, $F(5, 470) = 1.17$, $p = .321$. Welch's ANOVA was retained to accommodate unequal department sample sizes without relying on the equal-variance assumption. The analysis found no statistically significant differences in Engagement across the six departments, $F(5, 162) = 0.683$, $p = .637$.

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Result: $F(5, 162) = .683$, $p = .637$.

The analysis did not identify a statistically significant difference in Engagement among the six departments at Wave 3. This analysis differs from the earlier comparison in both grouping structure and unit of analysis: six departments at one wave versus two predefined groups using employee-level averages across available waves.

G. Exploratory Factor Analysis

Purpose: Explore whether seven employee experience items exhibited a common underlying structure.

The Wave 3 analysis included Manager Support, Workload Manageability, Leadership Trust, Career Growth, Recognition, Psychological Safety, and Engagement.

- Extraction: Minimum residual (MINRES)
- Rotation: Oblimin
- Factor retention: Parallel analysis
- Bartlett's test: $\chi^2(21) = 225$, $p < .001$
- Overall KMO: .707

Parallel analysis supported a one-factor solution under the selected criteria.

Item	Factor Loading	Uniqueness
Manager Support	.372	.861
Workload Manageability	.435	.811
Leadership Trust	.344	.882
Career Growth	.330	.891
Recognition	.368	.864
Psychological Safety	.327	.893
Engagement	.717	.485

Although the factorability checks supported proceeding with an exploratory analysis, the retained factor was dominated by Engagement. The other items had comparatively modest loadings and high uniqueness.

Conclusion: The results do not provide sufficient evidence to combine these seven individual items into a validated single employee experience scale. Further measurement development would require additional items, theoretical refinement, and validation.

H. Integrated Interpretation

Across the analyses, three organizational priorities emerged:

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1. Investigate the decline in Leadership Trust, particularly the significant difference between the first and final waves.
2. Examine workload conditions within Operations and Customer Services, where Workload Manageability showed the largest departmental group effect.
3. Explore Career Growth alongside Workload Manageability and Leadership Trust as factors associated with Intent to Stay.

These are evidence-informed areas for further investigation, not demonstrated causes of employee behavior.

I. Methodological Limitations

Synthetic data: The dataset was created for analytical demonstration and does not represent an actual employer or employee population.

Survey participation and missingness: Participation declined across waves, and not every respondent completed all three waves or answered every item. Available-case descriptive results and complete-case inferential analyses therefore use different sample sizes.

Measurement: Survey variables are individual five-point items, not independently validated multi-item instruments. The exploratory factor analysis does not establish a validated composite scale.

Observational design: Associations and group differences do not demonstrate causality. Intent to Stay is a reported intention, not observed retention or turnover.

Analytical scope: The regression describes relationships in the Wave 3 complete-case sample. The ANOVA and factor analysis are exploratory. Findings should be interpreted in light of the selected group definitions, sample restrictions, and testing procedures.

J. Tools and Deliverables

Analytical tools: jamovi, R, Power BI.

Deliverables: Executive dashboard, descriptive and inferential analysis, statistical validation, organizational recommendations, portfolio case study, and this technical appendix.

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