Development of Key Variance Visualizations of Analytic Workflow for the Support of Data Based Discussions of Branch/Division Work Alignment: The WestWolf Field Study

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Abstract

Twenty-four analysts reported the extent to which their peers underdo and underdo 14 dimensions of behavior under normal conditions. Additionally, they indicated whether overdoing/underdoing affects performance. Dimensions were ranked based on (1) their mean underdo/overdo rating and (2) the percent that said it affects performance. Top ranked dimensions represent areas of key variance, or opportunities for intervention. Cluster analysis identified four unique subgroups of analysts that tend to underdo/underdo the same behaviors, with differences in areas of key variance. Results indicate that a one-size-fits-all intervention may not be the best solution to align workflow. Visualizations were created to facilitate data based discussions amongst branch leaders and subordinates.

Field Study

- An entire branch of analysts participated (N = 24)
- Participants were issued anonymity
- A trusted analyst administered survey
- Analysts described key variance of their peers
- With experience, analyst could complete a key variance form in 15 minutes or less
- Visualizations generated in R code

Analysis Process

1) Is there variance in analytic workflow?
   - Graphed mean underdo/underdo ratings
2) Does variance in analytic workflow affect performance?
   - Searched percentage that said “yes” by dimension
3) Where is the key variance?
   - Calculated avg. rank based on above criteria
4) Are there meaningful subgroups of analysts?
   - Conducted cluster analysis
5) How do the subgroups differ?
   - Demographics
   - Compared to rational groups
   - In areas of key variance

Key Variance Analysis

What is key variance analysis?
The identification of variance in the performance of workflow activities that affects performance

Q1: Is there variance in analytic workflow?
Q2: Does variance in analytic workflow affect performance?

Cluster Analysis
Q4: Are there meaningful subgroups of analysts?
Q5: How do the subgroups differ?

Managerial Reports

Where should I concentrate my efforts?
In those areas that rank highest in mean ratings and impact on performance

Conclusions & Next Steps

SME feedback on this approach indicates that it may play an important role in facilitating data based discussions to improve analytic workflow. Results reported here need to be replicated in other branches and extended to include managerial and researcher/developer workflows. More work is also needed to better understand how to conduct data based discussions of workflow.