An Empirical Study on Content Analysis Use in Test and Evaluation Deficiency Report Analysis

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2018 NPS 15th Annual Acquisition Research Symposium
9 May 2018

Research objective

- The objective of this research study was to investigate different ways that system issues with assigned deficiency classifications are prioritized for resolution.

- Of particular interest were the strategies individuals used to prioritize a list of deficiencies for resolution, with or without prior knowledge of the content analysis methodology.

Research design

- All subjects were asked to complete the following tasks:
  - Read the provided T&E deficiency report that described testing performed on a generic aircraft flight simulator. Deficiencies were already assigned an issue prioritization code (25 issues total: 11 Part II and 14 Part III).
  - Using an Excel spreadsheet, look for patterns and themes in the provided deficiency descriptions and create categories to help prioritize the issues for resolution.
  - Create a prioritized deficiency list indicating the order the deficiencies should be resolved.
  - Complete questionnaires that captured/assessed:
    - Work/Education background and prior T&E experience
    - The classification strategies they used,
    - Perceived classification task difficulty,
    - The value they assigned to doing the classification task as part of deficiency prioritization
    - The impact the categories had on the priority order.

Key categorization results

- Total participants – Five (5)
  - Pilot study: One volunteer subject
  - Main study: Four volunteer subjects
  - Three subjects assigned to the training condition
- Categorization results:
  - Each subject made a judgment of circumstance, scope and criticality. However, the same issues were not all assigned to the same categories.
  - Four out of five subjects created a scheme with an inherent or defined hierarchy.
    - Only 1 subject incorporated the Test Personnel prioritizations into their categorization and prioritization scheme.

Table 1 Sample
rt II Category Resu

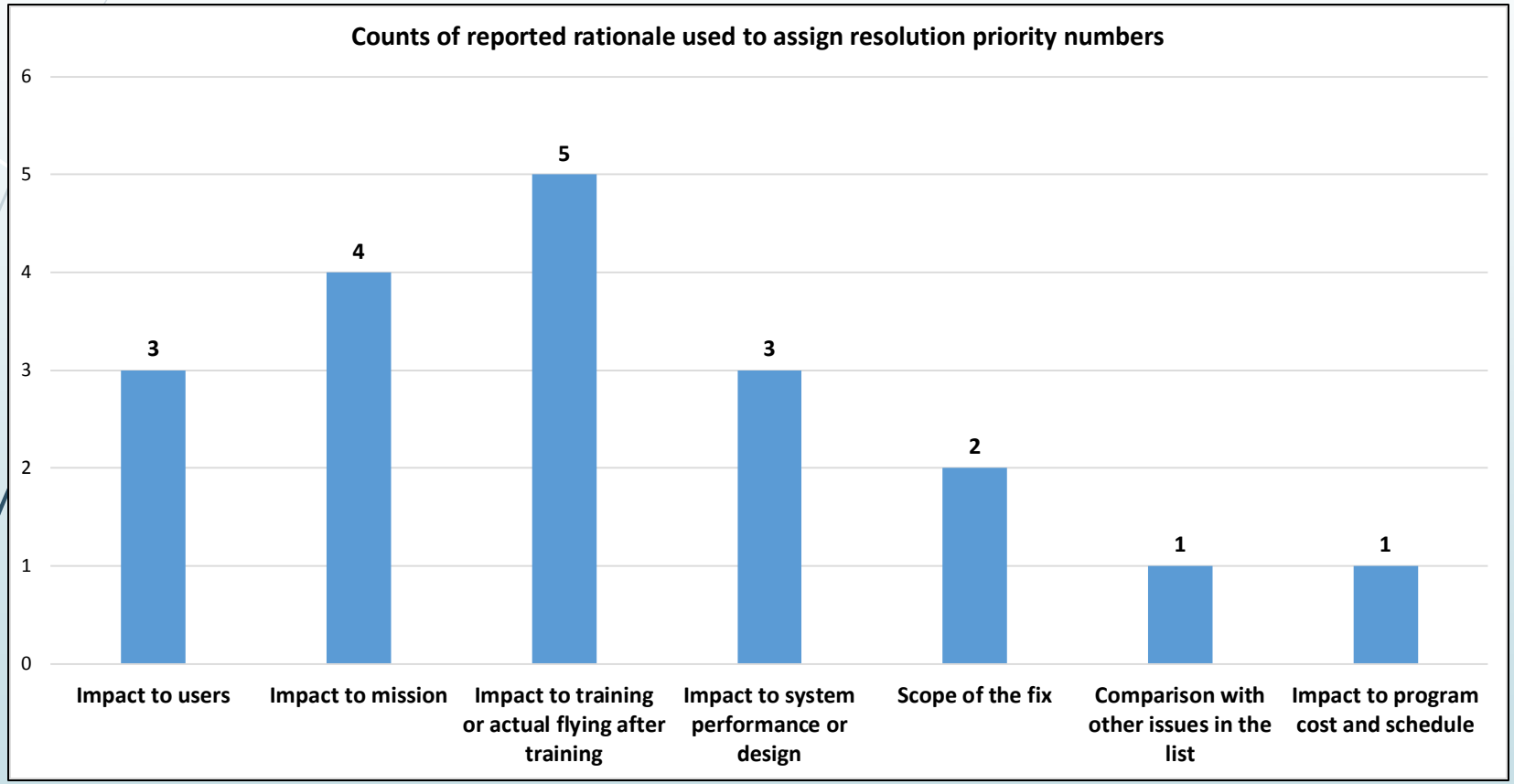
Key Prioritization Results

- Subjects were specifically asked to assign a unique priority number to each issue, without duplication of ranking
  - Three subjects used a 1-25 scale and assigned a unique resolution priority number to each issue.
  - Two subjects used alternate scales.
    - One subject assigned all issues either a 1, 2 or 3.
    - One subject used a scale dependent upon the number of issues in each category.
      - For example, ten issues assigned to the 'hardware' category were assigned resolution priority numbers 1-10. The twelve issues assigned to the 'simulation software' category were assigned resolution priority numbers 1-12.
    - Using these scales resulted in multiple issues with the same resolution priority ranking that require further prioritization within each of these subsets.

Table 3 Part II Priority Results

Key questionnaire results

- Category/Priority Rationale:



Key questionnaire results

- Workload Assessment:
  - In general, subjects in the training condition rated the mental demand to be high, but the frustration level low.
  - Those in the training condition rated their overall performance completing the tasks lower than those in the non-training condition.
- Perceived Value Assessment:
  - Three out of five rated the value of categories highly because they used their categories to help them assign resolution priority numbers to the issues.

	Mental Demand	Temporal Demand	Performance	Effort	Frustration Level	Value of Categories	Impact of Categories
Subject 2 (NT)	4	5	7	6	3	No score provided	No score provided
Subject 4 (NT)	9	10	8	10	9	10	10
Subject 1 (T)	9	9	4	6	4	10	10
Subject 3 (T)	8	2	6	8	3	6	8
Subject 5 (T)	6	6	4	5	3	8	1
Average Rating:	**7**	**6**	**6**	**7**	**4**	**8**	**6**

Conclusions & Future research

- All subjects judged the severity of each issue to come up with a resolution priority order.
- The subjects' strategies were very different, with a high degree of subjectivity in methodology used.
- There were no apparent correlations between educational background, prior T&E experience, and strategy used.
- The impact of the content analysis training on categorization and prioritization was inconclusive.
- With a greater number of study participants, more repetition in similar strategies might have been observed.

- The ultimate objective of further research in this topic is to generate a categorization and prioritization scheme that produces consistent results across personnel from a variety of backgrounds.
  - With such a scheme identified, further research to develop software tools and/or training for workforce development would be logical next steps.

Questions ?