Custom Made Surveys

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Goals

- When is a custom made survey appropriate?
- What are the golden rules for writing questions?
- Why are Likert questions preferred?
- How does formatting impact data?

When to design a survey

Appropriate

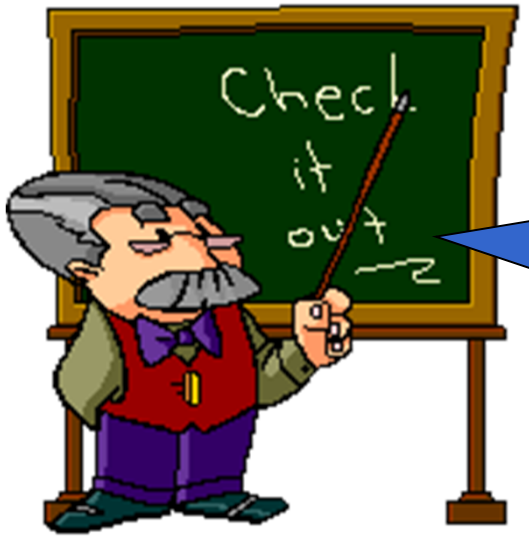
1. **There isn't an appropriate empirical survey**
2. **Measure specific user/maintainer thoughts**
   - Specific features/ components
   - Specific issues with regard to CONOPS
3. **Quantify observer ratings**
   - Special case

"A good plan is like a road map: it shows the final destination and usually the best way to get there."
H. Stanely Judd

Not Appropriate

1. **Non specific information sought from respondents**
   - Interview
2. **Measure performance**
   - Time
   - Accuracy via appropriate physical measure
3. **Measure requirements**
   - Appropriate physical measure
4. **Measure situation awareness**
   - Numerous techniques in human factors literature
   - Salmon et al (2006) for review

Human factors of survey design



Survey Design Goal:
Get Accurate Data from the Respondents in a Usable Form to Address Survey's Purpose

Video on importance of asking the right question?

Who	Role	Sources of error
OTA & DOT&E	Defines survey's purpose & uses information from survey	• Not enough information • Wrong information
System operator /maintainer	Gives data	• Answers a different question • Thinks too much • Doesn't think enough
Analyst	Translates data into information	• Data transfer • Data aggregation

IDA

Parts of a question

- Identifier – helps data analyst and respondent keep track of where they are in survey
- Item – the words the respondents are addressing
- Response – the data the respondent provides, which can be constrained by the survey writer (closed response) or not (open response)

1. How many parts of a question are there?

-1 - 2 - 3 - 4 - 5

IDA

5 golden rules of writing items

Singularity:	Only 1 Idea Per Question
User Friendly:	Items Do Not Require a Lot of Thought or Interpretation (e.g., short, clear, specific)
Neutrality:	Items Do Not Imply Value Judgments Items Are Not Emotionally Charged
Knowledge Liability:	Respondents Have Enough Information to Answer the Question
Independence:	Responses Will Not Affect Responses to Other Questions

IDA

Some words to avoid in writing surveys

Knowledge Liability Singularity User Friendly Neutrality Independence

- Accurate
- Timely
- Situation Awareness
- Effective
- Efficient
- n/a
- And
- Each
- All
- Never
- None
- Better
- Easier
- Improved
- Based on
- If
- Considering

Examples of best practice violations

1. The system is efficiently reliable.

User Friendly

Unclear what the goal of the question is. Therefore no recommended rewording.

IDA

2. Is the training materials complete?

IDA

2. Is the training materials complete?

Knowledge Liability

User Friendly – grammar

2. I felt as if I needed more training.

IDA

3. The amount and type of training provided to the X position allowed them to employ the system.

IDA

3. The amount and type of training provided to the X position allowed them to employ the system.

Knowledge Liability

IDA

3. The amount and type of training provided to the X position allowed them to employ the system.

Knowledge Liability

Singularity

3. I felt as if I needed more training.

IDA

4. The SSO functionality increases my productive time within the clinic by reducing the amount of time I spend logging into different applications when documenting the healthcare provided.

Strongly Agree	Somewhat Agree	Slightly Agree	Slightly Disagree	Somewhat Disagree	Strongly Disagree

IDA

4. The SSO functionality increases my productive time within the clinic by reducing the amount of time I spend logging into different applications when documenting the healthcare provided.

Neutrality

User Friendly – 27 words!

4. The SSO function is useful.

Strongly Agree	Somewhat Agree	Slightly Agree	Slightly Disagree	Somewhat Disagree	Strongly Disagree

IDA

5. Based on your responses above, rate the acceptability of the system.

IDA

5. Based on your responses above, rate the acceptability of the system.

Independence

User Friendly

(acceptability in terms of what)

5. I would like to use this system to accomplish the mission.

IDA

6. Rate the acceptability of the system's launch acceptability region (LAR) displays provided to support accurate and timely system employment.

IDA

6. Rate the acceptability of the system's launch acceptability region (LAR) displays provided to support accurate and timely system employment.

Knowledge Liability

IDA

6. Rate the acceptability of the system's launch acceptability region (LAR) displays provided to support accurate and timely system employment.

Knowledge Liability
Singularity

IDA

6. Rate the acceptability of the system's launch acceptability region (LAR) displays provided to support accurate and timely system employment.

Knowledge Liability
Singularity
User Friendly
(repeated and unnecessary words)

6. The launch acceptability region (LAR) displays provide useful information.

IDA

7. Rate the adequacy of air-search radar & combat system to correctly decide to engage/not engage each track per Combat System Engagement Doctrine.

IDA

7. Rate the adequacy of air-search radar & combat system to correctly decide to engage/not engage each track per Combat System Engagement Doctrine.

Knowledge Liability

IDA

7. Rate the adequacy of air-search radar & combat system to correctly decide to engage/not engage each track per Combat System Engagement Doctrine.

Knowledge Liability

Singularity

User Friendly – 22 words!

7. I trusted the system's engagement decisions.

IDA

8. Rate the overall usefulness of the report: Accuracy

Completely unacceptable	Largely unacceptable	Somewhat unacceptable	Somewhat acceptable	Largely acceptable	Completely acceptable

IDA

8. Rate the overall usefulness of the report: Accuracy

Completely unacceptable	Largely unacceptable	Somewhat unacceptable	Somewhat acceptable	Largely acceptable	Completely acceptable

Knowledge Liability

Response Options Don't Match Item

User Friendly

(What is being rated: report acceptability, usefulness, or accuracy?)

8. The content of the report is useful.

Strongly Agree	**Somewhat Agree**	**Slightly Agree**	**Slightly Disagree**	**Somewhat Disagree**	**Strongly Disagree**

Response types

Closed

- **Dichotomous** Binary
  (yes/no)
- **Multiple Choice** Categorical
  (a, b, c, d)
- **Ranking** Categorical
  (1 – best, x –worst)
- **Response Continuum** Interval
  - Behaviorally Anchored
    (Once an Hour, Once Every 2-3 Hours, Once Every 4-5 hours, etc..)
  - Likert & Likert Like
    (Strongly Disagree, Somewhat Disagree, Somewhat Agree, Strongly Agree)

Open Qualitative

- **Fill In (__yrs)**
- **Free Response**

Response Continua: Better data for analysis

Is your workspace acceptable?

1. It is perfect, I wouldn't change anything.
2. It is the best space available, but I would change things if I could.
3. I am able to function in my workspace, but better spaces are available.
4. I am unable to function in my workspace.

My workspace is acceptable.

Strongly Disagree	Somewhat Disagree	Slightly Disagree	Slightly Agree	Somewhat Agree	Strongly Agree

Rate your workspace.

Completely Acceptable	Reasonably Acceptable	Barely Acceptable	Barely Unacceptable	Reasonably Unacceptable	Completely Unacceptable

Improved consistency between respondents = higher reliability
More sensitivity & specificity = higher validity

Response continuum data: Ordinal or Interval

Overview: 4 day operational test & evaluation
Sample & factors: 28 respondents, day surveyed, demographics
Response variable: single 4 point Likert-like question

Ordinal Regression

Factor	Likelihood-Ratio χ^2	p-value
Day	13.59387647	0.0035 *
Organization	19.49224628	0.0006 *
Experience in Position	3.724129051	0.2928
Experience with AOC	1.4540963	0.6929

Factor	F	p-value
Day	3.7883	0.0129 *
Organization	4.3574	0.0028 *
Experience in Position	1.5106	0.2168
Experience with AOC	0.5377	0.6576

Linear Regression

If the survey and test are well-constructed, you will draw the same conclusions from both analytical methods!

Respondent Motivation

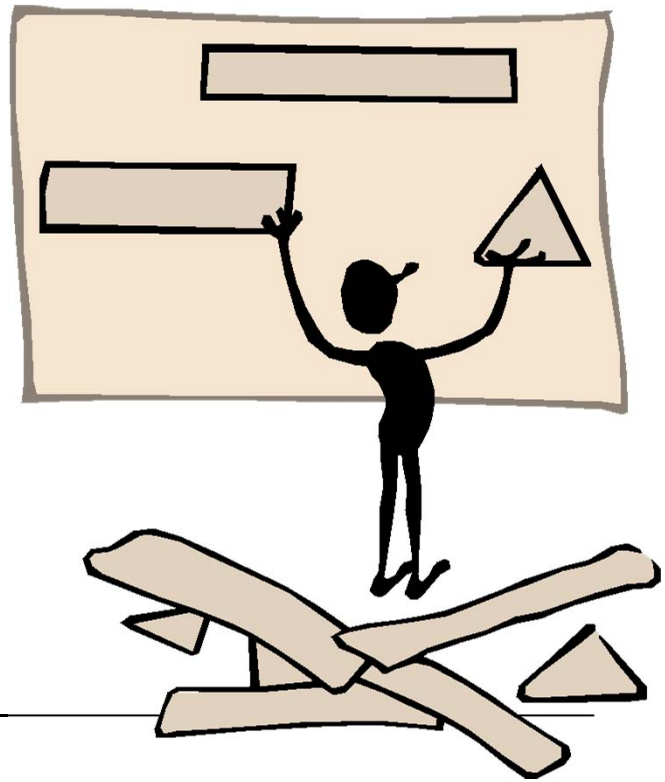
*neither is not an appropriate response in this example

Formatting Surveys

- **Provide brief clear introduction**
- **Keep the survey as brief as possible to obtain the necessary information**

1. Minimize the respondents' burden (perceived & real)

2. Maximize the importance of the respondents' contribution



Formatting considerations of different survey types

Post Test

After all activities completed

- Thoughts/feelings that will not change based on test factors or time
- **Longest Survey**

Natural Break Points

Daily/ Post Task

- Thoughts/ feelings that will change with time/ test factors:
  - workload
  - usability
  - task specific questions
- **Consider that questions will be repeated**
- **Number of questions is multiplied by the number of administrations**

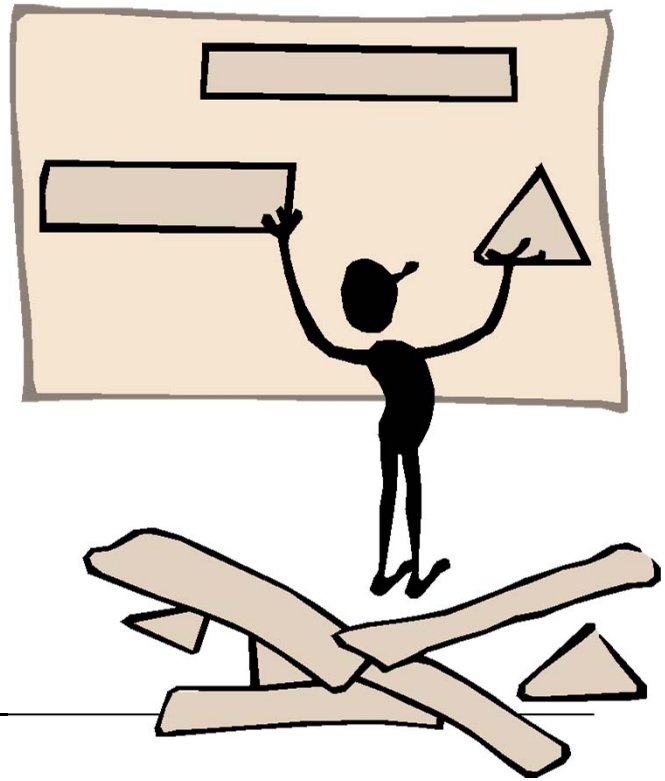
Event Driven

In response to unique occurrence

- Thoughts/ feelings about critical events (expected or unexpected)
  - Safety
  - Bugs
  - Uncommon tasks
- **Shortest survey**

Formatting surveys

- **Provide brief clear introduction**
- **Keep the survey as brief as possible to obtain the necessary information**
- **Group questions by topic & response type**
- **Logically ordered questions**
  - Begin with interesting items that are clearly connected to the goals of the survey
  - Follow order of events
- **Minimize open responses**
  - 1 open ended at end of each group/section
  - No more than 4 open ended at end of survey



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2. Maximize the importance of the respondents' contribution

Up Next

- **ABIS Case Study**
- **Administration & Analysis**
- **AF DCGS Case Study**