

Implementing a Standardized Error Classification and Feedback System to Improve Data-Entry Performance

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Presentation Overview

- UWSC's Data-Entry Production Levels
- UWSC's Data-Entry Modes
- Approach to Quality Control
 - Initial Production QC Phase
 - 10% QC Phase
- Standardized Feedback System
 - Error Classification Guide
 - DEO Reports

Survey Research --- Increased use of Mailings

- “...with the development of near-comprehensive address-based sample (ABS) frames, such as the U.S. Postal Service’s Delivery Sequence File (DSF), **mail may become used much more frequently...**” (Don Dillman & Benjamin Messer, 2010)
 - Constraints with phone-based sampling.
 - Mixed-mode projects on the rise.
 - Address-based sampling
- UWSC has seen more advance letters for phone projects, letter invites to complete web surveys, & SAQ mailings.

More SAQ Mailings = More Data Entry Projects!

- **UWSC enters ~1500 cases every two weeks** (compared to ~500/2wks prior to 2009).
 - Number varies: Peaks & valleys, sample sizes.
- **Kept pace with production increases by...**
 - Training new DEO's
 - Department tripled in size between April 2008 & May 2011.
- **Maintained data-quality by...**
 - Upgrading QC & feedback system
 - Selecting appropriate staff for difficult projects and tight deadlines.

Data Entry Modes @ UWSC

- **Most projects 'single entry'.**
- **WEB**
 - Entered via internet site (by R or DEO)
 - Can view data in Access DB
- **TELEforms** (Scanning Software)
 - Best for short, simple SAQ's (1-4 pgs)
 - Software has trouble with open-ended items
 - Faster, but still requires DEO involvement & QC
 - Can view data after entry in SPSS file
- **CASES**
 - Used for CATI & SAQ data-entry
 - Dos-based
 - Can view entry in 'trace file'.

Training, Quality Control(QC), & Feedback

- Select Staff (Experienced? Available?)
- Hold group trainings to provide project-specific protocols.
- **Require 'Initial Production QC Phase' (New)**
- Provide timely feedback (to reduce impact)
 - 1-2 rounds of **'10% QC'**, perform early in field period.
- Provide standardized, objective feedback
 - Supervisors use **'Error Classification Guide' (New)**
- Inform employee of overall project performance.
 - **'DEO Reports' (New)**

Performing Quality Control

- **Main benefit:** To identify & resolve systematic errors (if any)
- Compare SAQ to trace file & Identify errors.
 - Items entered accurately (eg: DEO enters 2 vs. 3)?
 - Proper protocol applied (eg: Handle multiple answer)?
 - Open ended responses captured verbatim?
- **Document** errors in excel spreadsheet.
- **Communicate** all errors to DEO and fix data (if necessary).
- **UWSC's standard = 10%**
 - Became tough to keep up with production increases!

Select 10% of Each DEO's Work (via Intranet Tool)

	A	B	C	D	E	F	G	H	I
1	Case ID	Interviewer	Type	Date	Code	Start	Finish	Length	Elapsed
2	E403046	DOE, JOHN	CONVERSION	5/10/2011	1100	16:13:53	16:17:59	0:04:06	0:00:00
3	E403047	DOE, JOHN	CONVERSION	5/10/2011	1100	16:18:47	16:20:25	0:01:38	0:00:48
4	E403050	DOE, JOHN	CONVERSION	5/10/2011	1100	16:20:53	16:22:30	0:01:37	0:00:28
5	E303006	SMITH, BOB	CONVERSION	5/10/2011	1100	16:20:46	16:23:29	0:02:43	2:21:14
6	E403054	DOE, JOHN	CONVERSION	5/10/2011	1100	16:22:57	16:24:07	0:01:10	0:00:27
7	E303005	SMITH, BOB	CONVERSION	5/10/2011	1100	16:25:49	16:27:52	0:02:03	0:02:20
8	E301020	SMITH, BOB	CONVERSION	5/10/2011	1100	16:30:09	16:32:07	0:01:58	0:02:17
9	E111011	DOE, JANE	CONVERSION	5/10/2011	1100	16:28:31	16:33:51	0:05:20	3:03:41
10	E226062	SMITH, BOB	CONVERSION	5/10/2011	1100	16:33:33	16:35:43	0:02:10	0:01:26
11	E111003	DOE, JANE	CONVERSION	5/10/2011	1100	16:34:14	16:37:32	0:03:18	0:00:23
12	E111002	DOE, JANE	CONVERSION	5/10/2011	1100	16:37:58	16:39:47	0:01:49	0:00:26
13	E111005	DOE, JANE	CONVERSION	5/10/2011	1100	16:40:06	16:41:25	0:01:19	0:00:19
14	E111021	SMITH, MARY	CONVERSION	5/12/2011	1100	9:33:32	9:37:57	0:04:25	0:00:00
15	E111008	DOE, JANE	CONVERSION	5/12/2011	1100	9:36:38	9:40:32	0:03:54	0:00:00
16	E206030	SMITH, MARY	CONVERSION	5/12/2011	1100	9:38:10	9:40:38	0:02:28	0:00:13
17	E206043	SMITH, MARY	CONVERSION	5/12/2011	1100	9:40:57	9:42:48	0:01:51	0:00:19
18	E206029	DOE, JANE	CONVERSION	5/12/2011	1100	9:40:49	9:43:23	0:02:34	0:00:17
19	E206027	DOE, JANE	CONVERSION	5/12/2011	1100	9:43:40	9:45:08	0:01:28	0:00:17
20	E206050	SMITH, MARY	CONVERSION	5/12/2011	1100	9:43:09	9:45:32	0:02:23	0:00:21

CASES Data-Entry Instrument

```
Command Prompt - appleteaprac
Caseid: 9967 Existing answer: "3"
Item: q14

How worried are you about your current financial condition?

<1>    Extremely worried
<2>    Very worried
<3>    Somewhat worried
<4>    A little worried
<5>    Not at all worried

<d>    Don't Know
<r>    Refused
<b>    Blank

3
```

CASES Trace File (QC Tool)

```
Command Prompt - list 9967.tra
LIST      7      131      05-14-;1 19:59  9967.TRA
          :      :      :db:Mon Apr 18 10:05:39 2011
inum@     : 1:0002:an:1451
confirm1@ : 1:0003:an:9967
q1@       : 1:0012:an:1
q2@       : 1:0014:an:2
q3@       : 1:0023:an:2
q4@       : 1:0027:an:1
q5@       : 1:0036:an:2
q6@       : 1:0040:an:2
q7@       : 1:0043:an:2
q8@       : 1:0045:an:1
q9@       : 1:0050:an:4
q10@      : 1:0054:an:1
q11@a    : 1:0058:an:2
q11@b    : 1:0062:an:b
q12@     : 1:0068:an:1
q13@     : 1:0072:an:2
q14@     : 1:0080:an:3
q15@     : 1:0083:co:h
q14@     : 1:0364:an:3
q15@     : 1:0367:an:1
q16@     : 1:0370:co:b
q15@     : 1:0375:an:2
Command>_ Options: d7kMpswTaLJ Keys: X=exit ?=Help
```

'Initial Production QC Phase' (Recent Implementation)

- DEO accuracy generally high, but **noticed increase in errors** as many NEW DEO's were applied to production.
- Needed **preventive** measure to reduce errors
 - Only using 10% QC method wasn't enough.
 - More **cost effective** to prevent errors, than to fix afterward!
- Initial QC Phase:
 - Supervisor fully QC's first few prod. cases to ensure accuracy.
 - If errors found, supervisor provides **on-the-spot training** *before DEO can resume production.*
 - Requires DEO to **prove comprehension** of protocol & ability to enter data accurately.

Standardized Approach to Error Documentation

- **What constitutes an error?**
 - Doing more QC led to having more conversations about how to identify errors.
- **Performed DE-QC calibration efforts**
 - Compared QC results of same DE cases by different supervisors.
 - Noticed differences:
 - Level of detail, terminology used, understanding of isolated vs. systematic errors.
- Needed to ensure QC was being performed in standardized way, which led to the **'Error Classification Guide'** .

'Error Classification Guide'

- **Defined 5 types of errors:**
 - **Entry** (DEO entered 2 vs. 3)
 - **Typos** (Text not captured verbatim)
 - **Protocol** (Didn't handle multiple answer properly)
 - **Notes** (Didn't leave F1-note when should have)
 - **Miscellaneous** (Didn't sign SAQ upon completion)
- Provides **common language** for supervisors and DEO's to discuss QC results.
- Allows supervisor to **quantify and summarize results** *at project & DEO level*, which led to creation of 'DEO Reports'

Example of QC Documentation & Error Types

CSID	DEO	Date	Error Type	Item #	Notes	QC'd By
10001	1234	1/2/2012	E	q4	Entered '2' instead of '3'	ABC
20002	1234	1/3/2012	T	q8	Did not enter marginal comment verbatim	ABC
30003	1234	1/4/2012	P	q15a	Used range protocol instead of multiple answer protocol	ABC
40004	1234	1/5/2012	N	q24	Did not format note properly. Should have lead with 'R wrote, "..."'	ABC
50005	1234	1/6/2012	M	-	Did not initial or date case upon completion	ABC
60006	1234	1/7/2012	-	-	No errors	ABC
70007	1234	1/8/2012	-	-	No errors	ABC

DEO Reports

- Medium for providing feedback to DEO.
 - Individual results as compared to project averages.
- **Reports typically include DEO & Project Averages:**
 - Number of SAQ's completed by DEO
 - Number of SAQ's QC'd by supervisor (10%)
 - Total number of errors performed by DEO
 - Percentage of cases QC'd *without errors*.
 - % of total errors in each Error Classification.
 - Average completion time per case

Example #1 of DEO Reports

P9999 DEO Report_DEO #1		
DATE this report was completed: 7/22/10		
	Project	DEO
Total DE Completes	1145	296
Avg. Time per Completion	3.44	2.32
# of total errors	2(Avg)	1
% of cases without errors	88.60%	96.50%
Error Classifications		
# of cases QC'd for this DEO:	29	
Type of Error	Freq (#)	%
Entry	1	100%
Typos	0	%
Protocol	0	%
Notes	0	%
Miscellaneous	0	%
Total #/% of errors:	1	100%

•Faster than average completion time.

•Higher than average % of cases without errors.

•Only one entry error out of 29 cases QC'd!

Example #2 of DEO Reports

P9999 DEO Report_DEO #2		
DATE this report was completed: 7/22/10		
	Project	DEO
Total DE Completes	1145	315
Avg. Time per Completion	3.44	2.56
# of total errors	2 (Avg)	6
% of cases without errors	88.60%	81.20%
Error Classifications		
# of cases QC'd for this DEO:	33	
Type of Error	Freq (#)	%
Entry	3	50%
Typos	3	50%
Protocol	0	%
Notes	0	%
Miscellaneous	0	%
Total #/% of errors:	6	100%

• ***Faster than average DE times,***

• ***Lower than average accuracy rating.***

• ***Would advise DEO to enter more slowly for higher accuracy.***

Benefits of DEO Reports

- Provide DEO with info about overall performance per project (relative to other DEO's, based on averages).
 - Gives 'Big Picture' vs. case-level feedback.
- Allow for targeted (more efficient) training. Supervisors can focus on areas that need improvement when providing feedback.
- Provide consistent documentation (can be examined prior to raise reviews).
- Help supervisors make staff decisions for future projects
 - Apply best DEO's to most difficult projects!

DEO Reports: New Features In Development

- ‘% of cases without errors’---only tells part of the story.
- Want to include quantifiers that speak to length and/or complexity of project.
 - Eg: ‘average # of errors per page’.
 - Eg: ‘# of items in instrument’ (speaks to universe of potential errors).
- Working on master file of each DEO and all projects they work on, to track performance across time.
- Should create performance expectations (thresholds)

Conclusions

- Develop a quality control & feedback system that works for your data-entry department!
- The methods and tools described in this presentation have been successful for the UW Survey Center:
 - The 'Initial QC Phase'
 - '10% QC Phase'
 - 'Error Classification Guide'
 - 'DEO Reports'
- Have seen increased accuracy ratings and more consistent performance by DEO's!

Thank You!

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