



# **Survey Research Operations**

**Survey Research Center**

**Institute for Social Research**

# **Blaise Audit Trail Data in Relational Database**

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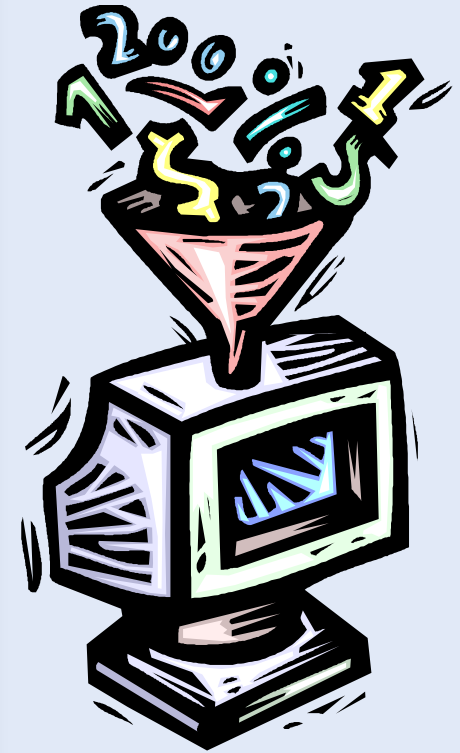
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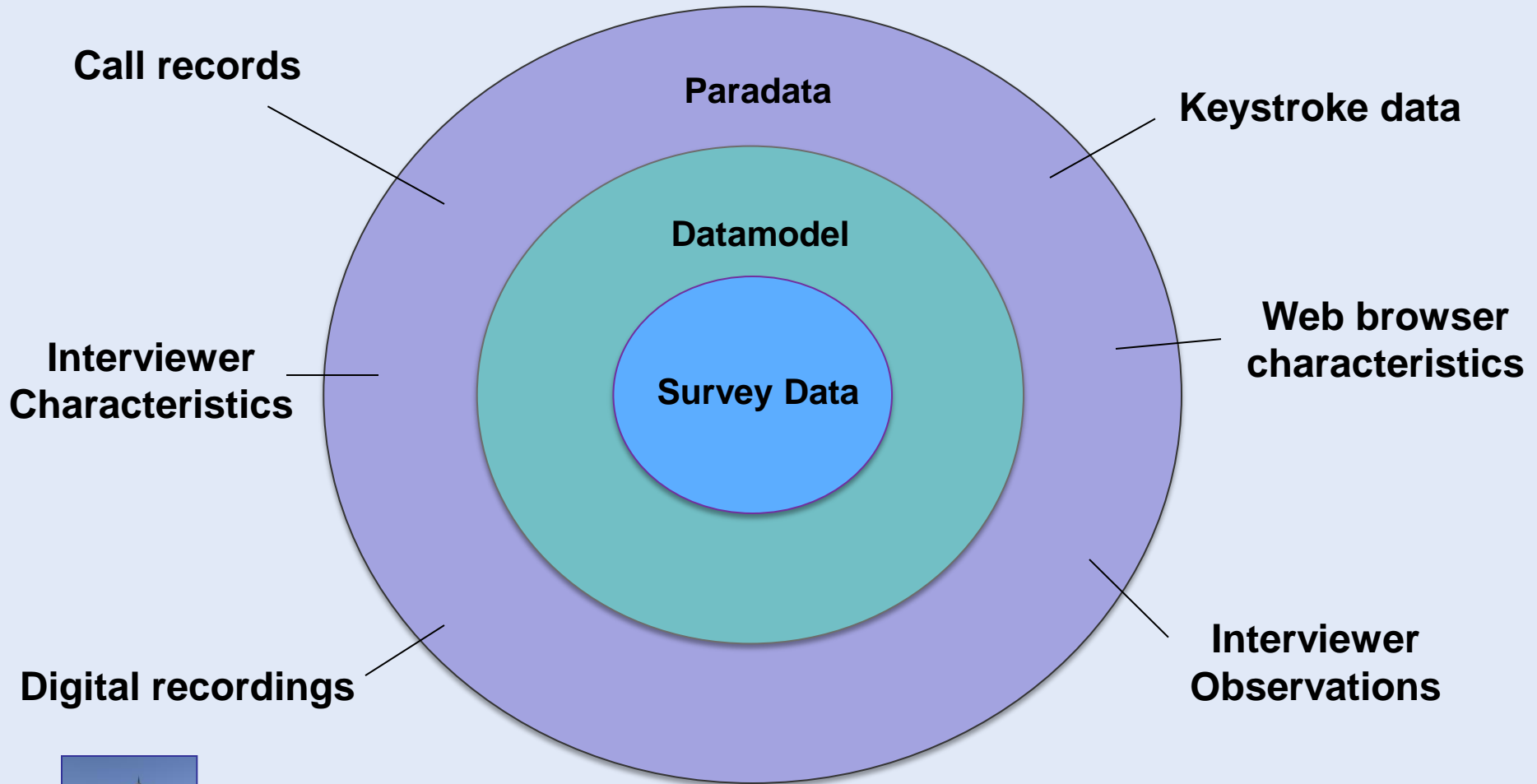
**International Blaise Users  
Conference 2012**

# The ADT File as Paradata

```
0789130010.adt x
0 10 20 30 40 50 60 70 80 90 100 110 120 130
1 "1/31/2010 9:08:21:435 PM", "Enter Form:1", "Key:0789130010 "
2 "1/31/2010 9:08:21:435 PM", "Metafile name:c:\blproj\HRS2010\Main\work\HRS10.bmi"
3 "1/31/2010 9:08:21:435 PM", "Metafile timestamp:Wednesday, January 27, 2010 3:28:40 PM"
4 "1/31/2010 9:08:21:435 PM", "WinUserName:16318142"
5 "1/31/2010 9:08:21:435 PM", "DictionaryVersionInfo:0.0.0.0"
6 "1/31/2010 9:08:21:521 PM", "Enter Field:SecA.StartInterview.A006 ", "Status:Normal", "Value:"
7 "1/31/2010 9:08:38:354 PM", "Mouse:253,56", "Message:LeftDown", "HitTest:Close"
8 "1/31/2010 9:08:38:354 PM", "Mouse:253,56", "Message:LeftDown", "HitTest:Close"
9 "1/31/2010 9:08:38:536 PM", "Mouse:252,56", "Message:LeftUp", "HitTest:Client"
10 "1/31/2010 9:08:39:261 PM", "(KEY:) 1[ENTR] "
11 "1/31/2010 9:08:39:593 PM", "Action:Store Field Data", "Field:SecA.StartInterview.A006 "
12 "1/31/2010 9:08:39:618 PM", "Leave Field:SecA.StartInterview.A006 ", "Cause:Next Field", "Status:Normal", "Value:1"
13 "1/31/2010 9:08:39:655 PM", "Enter Field:SecA.StartInterview.A007TRAlive_A", "Status:Normal", "Value:"
14 "1/31/2010 9:08:40:826 PM", "(KEY:) 1[ENTR] "
15 "1/31/2010 9:08:41:087 PM", "Action:Store Field Data", "Field:SecA.StartInterview.A007TRAlive_A"
16 "1/31/2010 9:08:41:197 PM", "Leave Field:SecA.StartInterview.A007TRAlive_A", "Cause:Next Field", "Status:Normal", "Value:1"
17 "1/31/2010 9:08:41:249 PM", "Enter Field:SecA.StartInterview.A002_IwBegin", "Status:Normal", "Value:"
18 "1/31/2010 9:08:44:839 PM", "(KEY:) 1[ENTR] "
19 "1/31/2010 9:08:45:200 PM", "Action:Store Field Data", "Field:SecA.StartInterview.A002_IwBegin"
20 "1/31/2010 9:08:45:219 PM", "Leave Field:SecA.StartInterview.A002_IwBegin", "Cause:Next Field", "Status:Normal", "Value:1"
21 "1/31/2010 9:08:45:257 PM", "Enter Field:SecA.StartInterview.A008ASex_A", "Status:Normal", "Value:"
22 "1/31/2010 9:08:47:533 PM", "(KEY:) 1[ENTR] "
23 "1/31/2010 9:08:47:934 PM", "Action:Store Field Data", "Field:SecA.StartInterview.A008ASex_A"
24 "1/31/2010 9:08:47:962 PM", "Leave Field:SecA.StartInterview.A008ASex_A", "Cause:Next Field", "Status:Normal", "Value:1"
25 "1/31/2010 9:08:48:025 PM", "Enter Field:SecA.StartInterview.A155_SelfPrxy", "Status:Normal", "Value:"
26 "1/31/2010 9:08:49:293 PM", "(KEY:) 1[ENTR] "
27 "1/31/2010 9:08:49:715 PM", "Action:Store Field Data", "Field:SecA.StartInterview.A155_SelfPrxy"
28 "1/31/2010 9:08:49:761 PM", "Leave Field:SecA.StartInterview.A155_SelfPrxy", "Cause:Next Field", "Status:Normal", "Value:1"
29 "1/31/2010 9:08:49:798 PM", "Enter Field:SecA.StartInterview.A012_LangSwitch", "Status:Normal", "Value:"
30 "1/31/2010 9:08:51:445 PM", "(KEY:) 1[ENTR] "
31 "1/31/2010 9:08:51:766 PM", "Action:Store Field Data", "Field:SecA.StartInterview.A012_LangSwitch"
32 "1/31/2010 9:08:51:807 PM", "Leave Field:SecA.StartInterview.A012_LangSwitch", "Cause:Next Field", "Status:Normal", "Value:1"
33 "1/31/2010 9:08:51:868 PM", "Enter Field:SecA.ContinuInterview.A165_A013_", "Status:Normal", "Value:"
34 "1/31/2010 9:08:53:592 PM", "(KEY:) 1[ENTR] "
35 "1/31/2010 9:08:53:958 PM", "Action:Store Field Data", "Field:SecA.ContinuInterview.A165_A013_"
36 "1/31/2010 9:08:53:976 PM", "Leave Field:SecA.ContinuInterview.A165_A013_", "Cause:Next Field", "Status:Normal", "Value:1"
37 "1/31/2010 9:08:54:046 PM", "Enter Field:SecA.ContinuInterview.A013_Continue", "Status:Normal", "Value:"
38 "1/31/2010 9:08:55:658 PM", "(KEY:) 1[ENTR] "
39 "1/31/2010 9:08:55:979 PM", "Action:Store Field Data", "Field:SecA.ContinuInterview.A013_Continue"
40 "1/31/2010 9:08:56:095 PM", "Leave Field:SecA.ContinuInterview.A013_Continue", "Cause:Next Field", "Status:Normal", "Value:1"
41 "1/31/2010 9:08:56:158 PM", "Enter Field:SecA.ContinuInterview.Ask_Birthdate.X004TmoBorn", "Status:Normal", "Value:"
42 "1/31/2010 9:09:03:448 PM", "(KEY:) 5[ENTR] "
43 "1/31/2010 9:09:25:563 PM", "Action:Store Field Data", "Field:SecA.ContinuInterview.Ask_Birthdate.X004TmoBorn"
44 "1/31/2010 9:09:25:589 PM", "Leave Field:SecA.ContinuInterview.Ask_Birthdate.X004TmoBorn", "Cause:Next Field", "Status:Normal", "Value:5"
```



# The ADT File as Paradata



# Paradata & Responsive Design

- **Concept introduced by Bob Groves and Steve Heeringa**
- **Requires assessment of available paradata inputs**
  - **Use these inputs to evaluate cost and error**
  - **Adjust design parameters during early data collection**
- **But the paradata must be easily available to analyze when needed!**



# ADT Database: Background

- **AT Report application (2004)**
  - **Standalone app to process groups of ADTs**
  - **Creates a local MS Access database**
  - **Exports pre-defined aggregate tables and standard timings reports**
    - Total interview time by sample id
    - Avg interview time by interviewer
    - Avg field time by field name
    - Avg block time by block name



# ADT Database: Background



# ADT Database: Background

- **Some disadvantages:**
  - **Only runs on-demand and is contained to user's local desktop machine**
  - **User needs access to ADT files; processing can take a long time**
  - **Raw data is not easily available for analysis**
    - Custom reports can be hard to build



# Relational Database Approach

- **Solution: process all production ADT files on a nightly basis and store the raw data in a relational database**
- **Advantages:**
  - **The ADT file itself becomes “invisible”**
  - **More efficient and secure use of data**
    - Available to all users and up-to-date
  - **Reduce the time needed to process files**
  - **Integration with other systems**







# Database Structure

- **Two major tables:**
  - **tADTField**
    - Contains raw ADT data
  - **tSuspendVariables**
    - Tracks instances of instrument suspension



# Database Structure: tADTField

Field Name	Data Type	Size	Description
<b>ProjectID</b>	Text	30	Unique project identifier
<b>CaseID</b>	Text	30	Sample ID within a project
<b>FldSeq</b>	Long Integer	4	Sequential counter; increments by one for each ADTrow
<b>MetaName</b>	Memo	-	Name of Blaise datamodel
<b>MetaTime</b>	Text	200	Date/Time Blaise datamodel was created
<b>UserID</b>	Text	30	Interviewer ID for this particular instrument entry
<b>FldName</b>	Memo	-	Blaise long field name
<b>BlockName</b>	Text	100	Blaise block name
<b>FormVstNum</b>	Long Integer	4	Instrument visit number; increments by one for each entry
<b>FieldVstNum</b>	Long Integer	4	Field visit number; increments by one for each entry
<b>PrevLeaveLineNo</b>	Long Integer	4	Previous field Blaise line number
<b>EnterLineNo</b>	Long Integer	4	Current field entered Blaise line number
<b>LeaveLineNo</b>	Long Integer	4	Current field exited Blaise line number
<b>ISLEAVEFORM</b>	Long Integer	4	Interviewer exited Blaise at this field (Yes/No)
<b>EnterDate</b>	Text	30	Date interviewer entered the Blaise field
<b>EnterTime</b>	Text	30	Time interviewer entered the Blaise field
<b>LeaveDate</b>	Text	30	Date interviewer left the Blaise field
<b>LeaveTime</b>	Text	30	Time interviewer left the Blaise field



# Database Structure: tADTField

Timing

Field Name	Data Type	Size	Description
<b>Fld_Time</b>	Text	30	Time (sec) spent within the Blaise field
<b>Fld_SS</b>	Text	30	Time (sec) spent within the Blaise field (different format)
<b>Fld_Time_Mss</b>	Long Integer	4	Time (milisec) spent within the Blaise field
<b>Btw_Time</b>	Text	30	Time (sec) spent between last Blaise field and this one
<b>Btw_SS</b>	Text	30	Time (sec) spent between last Blaise field and this one
<b>Btw_Time_Mss</b>	Long Integer	4	Time (milisec) spent between last Blaise field and this one
<b>Adj_Time</b>	Text	30	Fld_Time + Btw_Time
<b>Adj_SS</b>	Text	30	Fld_Time + Btw_Time
<b>Adj_Time_Mss</b>	Long Integer	4	Fld_Time + Btw_Time
<b>RspLat_Time</b>	Text	30	Time (sec) between entering field and first keystroke
<b>RspLat_SS</b>	Text	30	Time (sec) between entering field and first keystroke
<b>RspLat_Time_Mss</b>	Long Integer	4	Time (milisec) between entering field and first keystroke
<b>Key_Count</b>	Long Integer	4	Number of keystrokes while in Blaise field
<b>Enter_Value</b>	Memo	-	The value of the Blaise field upon entry
<b>Leave_Value</b>	Memo	-	The value of the Blaise field upon exit
<b>Leave_Cause</b>	Text	50	Action that initiated interviewer to leave Blaise field
<b>Leave_Status</b>	Text	50	Field leave value is normal or DK/RF
<b>Prev_Lang</b>	Long Integer	4	Language was switched to previous while in field (Yes/No)



# Database Structure: tADTField

Field Name	Data Type	Size	Description
Next_Lang	Long Integer	4	Language was switched to next while in field (Yes/No)
Set_Lang	Long Integer	4	Language was set while in field (Yes/No)
CtrlL_SetLang	Long Integer	4	Language was changed with hot key while in field (Yes/No)
ALTXExit	Long Integer	4	Alt-X interview suspension was initiated at this field (Yes/No)
RemClk	Long Integer	4	Interviewer remark was initiated at this field (Yes/No)
RemChng	Long Integer	4	Interviewer remark was changed at this field (Yes/No)
QHelp	Long Integer	4	QXQ Help was initiated at this field (Yes/No)
BlaiseHelp	Long Integer	4	Blaise Help was initiated at this field (Yes/No)
Error_Esc	Long Integer	4	Blaise check was closed at this field (Yes/No)
Error_Esc_Text	Memo	-	Text of the Blaise check encountered before closing
Error_Supp	Long Integer	4	Blaise check was suppressed (Escape) at this field (Yes/No)
Error_Supp_Text	Memo	-	Text of the Blaise check encountered before suppressing
Error_Jmp	Long Integer	4	Blaise field that interviewer jumps to after Blaise check
Error_Jmp_Text	Memo	-	Text of the Blaise check encountered before jumping
Media_Start	Long Integer	4	Blaise launched media file while in this field (Yes/No)
Mouse_Click	Long Integer	4	Any mouse click detected while in this field (Yes/No)

Help  
and  
Checks



# Database Structure: tADTField

Hot  
Keys

Field Name	Data Type	Size	Description
F1	Long Integer	4	F1 hot key was pressed while in this field (Yes/No)
F2	Long Integer	4	F2 hot key was pressed while in this field (Yes/No)
F3	Long Integer	4	F3 hot key was pressed while in this field (Yes/No)
F4	Long Integer	4	F4 hot key was pressed while in this field (Yes/No)
F5	Long Integer	4	F5 hot key was pressed while in this field (Yes/No)
F6	Long Integer	4	F6 hot key was pressed while in this field (Yes/No)
F7	Long Integer	4	F7 hot key was pressed while in this field (Yes/No)
F8	Long Integer	4	F8 hot key was pressed while in this field (Yes/No)
F9	Long Integer	4	F9 hot key was pressed while in this field (Yes/No)
F10	Long Integer	4	F10 hot key was pressed while in this field (Yes/No)
F11	Long Integer	4	F11 hot key was pressed while in this field (Yes/No)
F12	Long Integer	4	F12 hot key was pressed while in this field (Yes/No)
CtrlD	Long Integer	4	Ctrl-D hot key was pressed while in this field (Yes/No)
CtrlR	Long Integer	4	Ctrl-R hot key was pressed while in this field (Yes/No)



# Practical Applications

- **By having raw keystroke data in a database table, the ability to answer questions is significantly easier.**
  - **Are interviewers taking longer than average at certain fields?**
  - **How often do interviewers back up or suspend?**
  - **Do average interview lengths vary depending on the sample characteristics?**



# Applications: One Example

- **Total questionnaire length is becoming a concern for an active project...**
  - **How can ADT data be systematically analyzed in order to help determine the cause of the high interview lengths?**
  - **How would such an analysis aid in responsive design decisions?**





# Applications: One Example

- **Some possible questions:**
  - A wording change was introduced to some questions in the last datamodel version. Are these items taking significantly longer?
  - Are there particular areas where interviewers are accessing Help or entering comments?
  - Have there been changes in the total number of keystrokes on particular questions?
  - Where do interviewers tend to back up?



# Applications: One Example

- Comparing datamodel versions on a particular question:

```
SELECT ProjectID,  
       MetaTime AS DataModel_Version,  
       Count(MetaTime) AS N,  
       Avg(Adj_Time_Mss) AS Avg_AdjTime,  
       Std(Adj_Time_Mss) AS Std_AdjTime,  
       Max(FieldVstNum) AS Num_Visits,  
       Avg(Key_Count) AS AvgKey_Count,  
       Max(Key_Count) AS MaxKey_Count  
FROM tAdtField  
WHERE fldName = "SecB.Marriage2.B055_"  
GROUP BY ProjectID, MetaTime;
```

Version	N	Avg	Std	Visits	AvgKey	MaxKey
1	125	36781	48	3	1	3
2	222	8944	48	6	3	11
3	193	592	43	1	3	20



# Applications: One Example

- Identifying questions of concern:

```
SELECT fldname,  
       F2,  
       BlaiseHelp,  
       Qhelp,  
       RemClk,  
       Count(fldname) as Count  
FROM tADTField  
GROUP BY fldname  
WHERE F2 = 1  
       OR BlaiseHelp = 1  
       OR Qhelp = 1  
       OR RemClk = 1;
```

FldName	F2	QHelp	BlaiseHelp	RemClk	Count
EventHistory.SSN_Permission.W322_SCANLOGID	0	1	0	0	1
SecB.B084_IwMode	0	0	1	0	5
SecB.B084_IwMode	0	1	0	0	3
SecC.Rheumatism.C072_	1	1	0	1	1
SecD.Cognition1.D144_	0	1	0	0	1
SecD.Cognition1.D192_NumberSeries.D240_NSIntro_2	0	1	0	0	1
SecD.Cognition1 Feelings.D110_	0	1	0	0	1
SecE.KidStatus.E015_	0	1	0	0	1
SecG.ADL.G006_DiffStairs	0	1	0	0	1
SecN.MediCaidCarePlan.N009_	0	1	0	0	1
SecT.Wills.T050_T004MTemp[1]	0	1	0	0	1
SecV.V000_ModuleIntro	0	1	0	0	1



# Applications: One Example

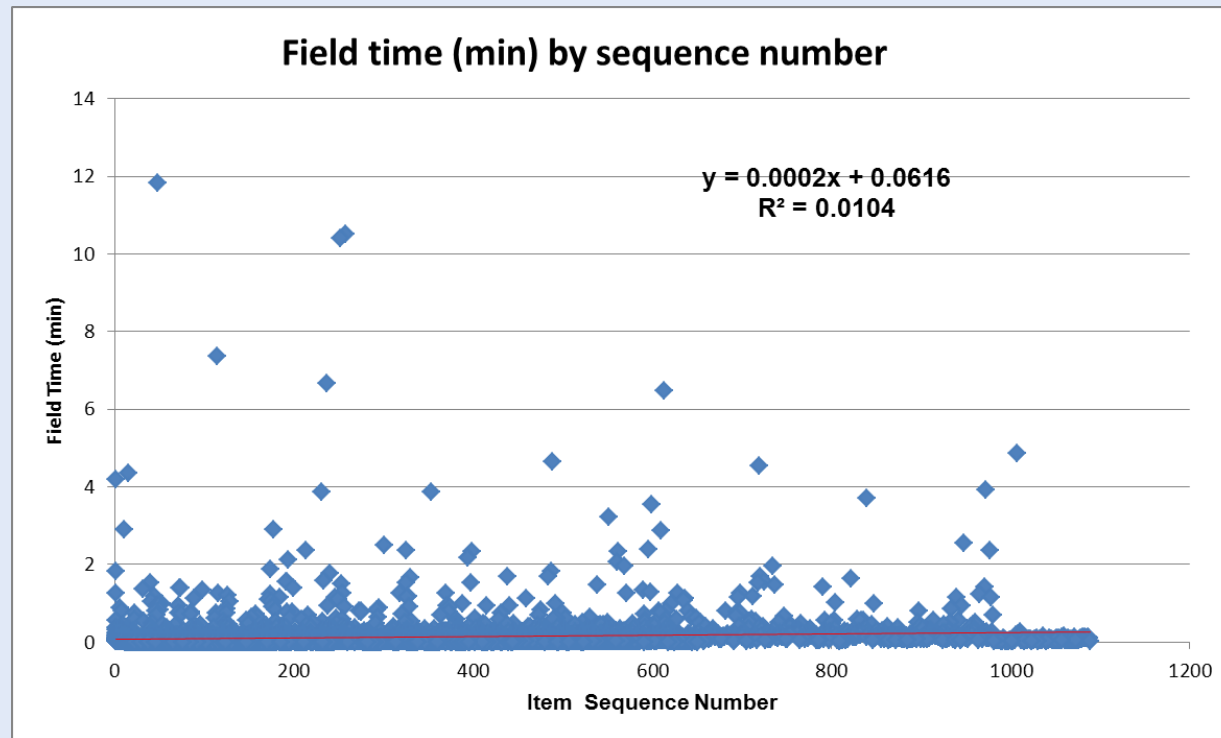
- **Where do interviewers back up?**

```
SELECT fldname,  
       Count(fldname) as Count  
FROM tADTField  
WHERE Leave_Cause IN ("Move Left","Move Up")  
GROUP BY fldname  
ORDER by fldname;
```



# Applications: One Example

- Chart field time by sequence number
  - Does the interview tend to lag as it goes on?



# Future Directions

- **Create canned reports based on common questions or analyses**
- **Integrate with other SRO systems and paradata**
- **Let users know the data is there!**



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**Thank You!**



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