

Using Software to Collect Data Electronically for the Economic Census

Amy E. Anderson
U.S. Census Bureau

Outline

- **Background**
 - What is the Economic Census?
 - The software
- **Research**
 - Timeline
 - Findings
- **Challenges for the future**

What is an Economic Census?

- **Largest collection of economic data from establishments in the U.S.**
- **Collected every 5 years**
- **Modes: Paper or electronic**
- **Main use is for the Gross Domestic Product (GDP)**
- **Includes over 600 form types based on industry classification**

The Software

- **Name: Surveyor**
- **Windows based application**
- **Downloadable**
 - Internet
 - CD (when requested)
- **Also used to collect 3 surveys**
 - Report of Organization (estab based)
 - Annual Survey of Manufactures (estab based)
 - Research and Development Survey (R&D)
 - Company based
 - Moving to a Web Application in the future

Other electronic reporting options

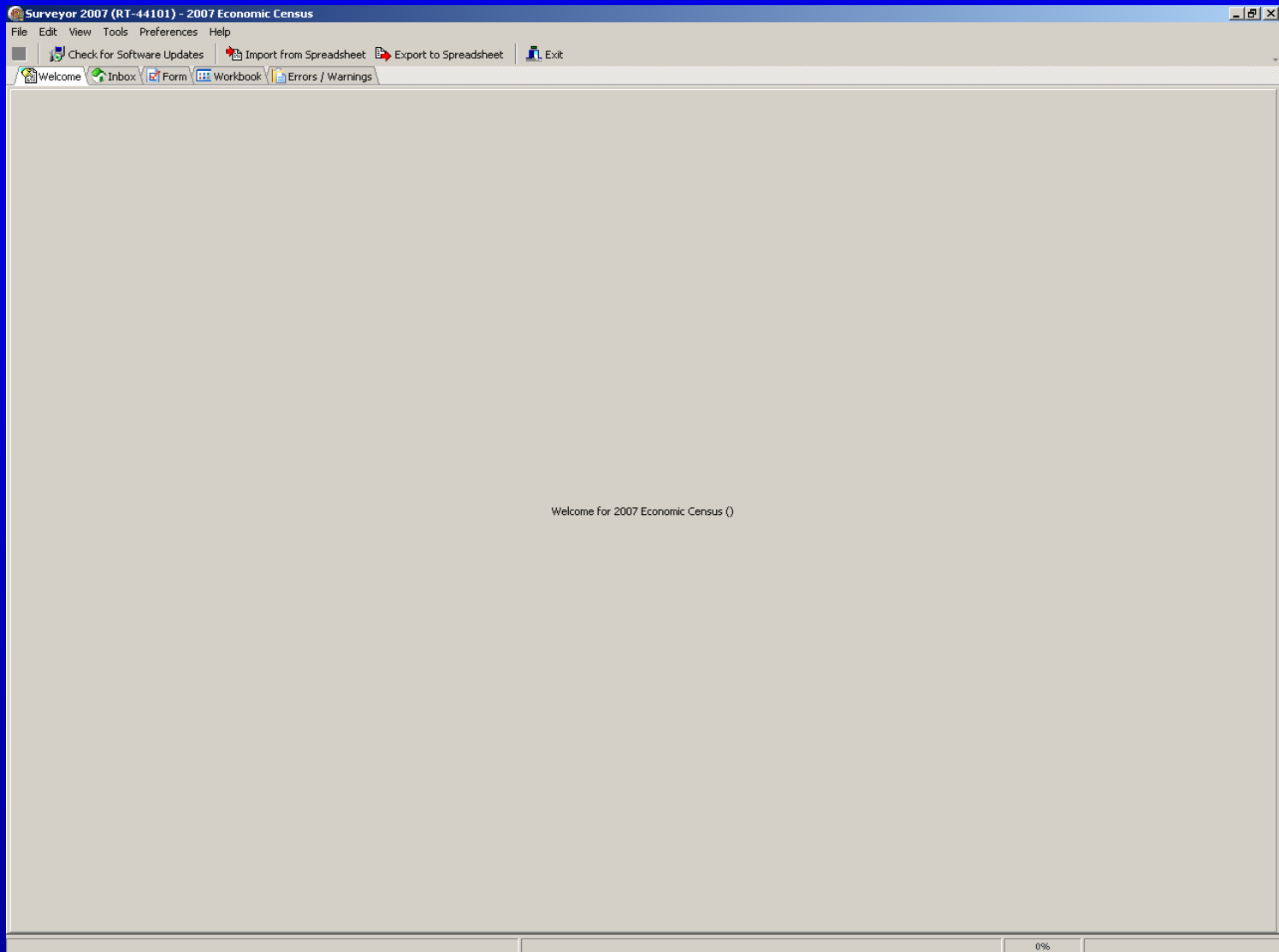
Census Taker = Web Application

1. **Manufacturers' Shipments, Inventories, and Order (M3) Survey (monthly)**
2. **Quarterly Financial Report (QFR)**
3. **Quarterly Services Survey (QSS)**
4. **Annual Retail Trade Survey (ARTS)**
5. **Annual Trade Survey (ATS)**

3 additional surveys in 2007

Surveyor Screens

Welcome Screen (page 2 in handout)



Inbox View (page 3 in handout)

Surveyor 2007 (RT-44101) - 2007 Economic Census

File Edit View Tools Preferences Help

Check For Software Updates Import from Spreadsheet Export to Spreadsheet Exit

Welcome Inbox Form Workbook Errors / Warnings

Available Surveys

2007 Economic Census

Quick Search - Type here to search the Form Inbox

Right click a column header to group by that column

Status	Errors / Warnings	Form ID	CFN	Store/Plant	Name	Name 2	Address
Not Started	-	RT-44101	2718281827	5758	Leon, the Walking Man's Friend		6207 James Mon
Not Started	0 / 3	IN-51101	2718281828	5056	My Daily Reader		512 Seventh Ave
Not Started	-	RT-44101	2718281829	5758	Tricky Richard's Previously Owned Automobiles		1600 13 1/2 Stre
Not Started	-	RT-44101	3246572141	5758	Agamemnon's One Heck of a Car Lot		876 Maple Rd
Not Started	-	RT-44101	4145611822	5758	Native American Village Motors		4790 W. 16th St
Not Started	-	RT-44101	4524587213	5758	Tesla Motors		11950 Potomac F
Not Started	-	WH-42301	5655463151	5758	Coyote Truck and Auto Services		146 Kings Grove
Not Started	-	WH-42301	7890123783	5758	Treadwell Porsche		901 E 165 Servi
Not Started	-	WH-42301	8890658753	5758	Griffin MotoTrux		2010 E Garvey A
Not Started	2 / 3	FI-52201	9000004296	523	Dewey, Cheatham, and Hu Federal Credit Union	N2299375335	322 Cocteau Cou
Not Started	1 / 4	IN-51101	9009000003		Daily Bugle		450 W 33rd St #
Not Started	-	IN-51101	9009000004	5056	The Seattle Pest-Intelligencer		1020 102nd Ave
Not Started	0 / 5	IN-51101	9009000005	5056	The Agnostic Science Monitor		Two Denmark Str
Not Started	0 / 9	IN-51101	9009000006	5056	Weekly Siftings Herald		205 South 26th S
Not Started	-	FI-52201	9009000185	5820	Cincinnati Federal Savings and Loan		10999 Reed Hart
Not Started	-	FI-52201	9009000186	5085	Them Bank		330 Canton Driv
Not Started	1 / 4	WH-42301	9009000188	5602	Goldbrick Motorcars		20602 Pascal Wa
Not Started	-	WH-42301	9009000189	5108	Roadville Hybrid Cars		31415 Main Stre
Not Started	0 / 1	FI-52201	9009000370	5897	Last National Bank	N5881034	202 W Main Stre
Not Started	-	FI-52201	9009000371	5299	Second National Bank and Trust		806 Nottingham :

0%

Form View (page 4 in handout)

Surveyor 2007 (WH-42301) - 2007 Economic Census

File Edit View Tools Preferences Help

Check For Software Updates Import from Spreadsheet Export to Spreadsheet Exit

Welcome Inbox Form Workbook Errors / Warnings

Question List:

- Mailing Address
- Reporting Unit Definition
- Item 1: Employer Identification
- Item 2: Physical Location
- Item 3: Operational Status**
- Item 4: Months in Operation
- Dollar Reporting Instructions
- Item 5: Sales, Shipments, Reco
- Item 7: Employment and Payro
- Item 9: Value of Inventories
- Item 10: Inventories by Valuat
- Item 16: Selected Expenses
- Item 19: A. Kind of Business
- Item 19: B. Type of Operation
- Item 20: Class of Customer
- Item 21: Method of Selling
- How to Report Percents
- Item 22: Detail of Sales, Shipp
- Item 24: Shipping and Handling
- Item 26: SPECIAL INQUIRIES
- Item 26: SPECIAL INQUIRIES
- Item 26: SPECIAL INQUIRIES
- Remarks

Store/Plant/CFN: 5758 / 5655463151
Coyote Truck and Auto Services
146 Kings Grove Ln
Hyndman, PA 15545
EIN: 63-9958936

WH-42301 2007 ECONOMIC CENSUS

5 OPERATIONAL STATUS

Which ONE of the following best describes this establishment's operational status at the end of 2007?

In operation

Temporarily or seasonally inactive

Ceased operation - Give date at right

Sold or leased to another operator - Give date at right
AND enter name and address of new owner or operator and Employer Identification Number (EIN) below

Name of new owner or operator EIN (9 digits)

Mailing address (Number and street, P.O. Box, etc.)

City, town, village, etc. State ZIP Code

Other - Specify

Previous Item Next Item

Review Panel Review Form

Kind	Item #	Explanation

0%

Workbook View (page 5 in handout)

Surveyor 2007 (WH-42301) - 2007 Economic Census

File Edit View Tools Preferences Help

Check for Software Updates Import from Spreadsheet Export to Spreadsheet Exit

Welcome Inbox Form Workbook Errors / Warnings

Form Types: X Store / Plant / CFN: S758 / 5655463151
Coyote Truck and Auto Services

All Locations - Selected 146 Kings Grove Ln
Hyndman, PA 15545
EIN: 63-9958936

This is hint #2 for rds:/census_2007/5655463151/RECORD_STORENUM

This is hint #3 for rds:/census_2007/5655463151/RECORD_STORENUM

S758

Errors / Warnings	FORM_MAILED	RECORD_CFN	RECORD_STORE NUM	RECORD_NAME1	RECORD_NAME2	ADDR_STREET
-	RT-44101	2718281827	S758	Leon, the Walking Man's Friend		6207 James Monroe Hwy
0 / 3	IN-51101	2718281828	S056	My Daily Reader		512 Seventh Avenue
-	RT-44101	2718281829	S758	Tricky Richard's Previously Owned Automobiles		1600 13 1/2 Street, NW
-	RT-44101	3246572141	S758	Agamemnon's One Heck of a Car Lot		876 Maple Rd
-	RT-44101	4145611822	S758	Native American Village Motors		4790 W. 16th Street, Suite 5
-	RT-44101	4524587213	S758	Tesla Motors		11950 Potomac River Drive
-	WH-42301	5655463151	S758	Coyote Truck and Auto Services		146 Kings Grove Ln
-	WH-42301	7890123783	S758	Treadwell Porsche		901 E 165 Service Rd S
-	WH-42301	8890658753	S758	Griffin MotoTrux		2010 E Garvey Ave S
2 / 3	FI-52201	9000004296	S23	Dewey, Cheatham, and Hu Federal Credit Union	N2299375335	322 Cocteau Court
1 / 4	IN-51101	9009000003	S056	Daily Bugle		450 W 33rd St # 3
-	IN-51101	9009000004	S056	The Seattle Pest-Intelligencer		1020 102nd Ave NE
0 / 5	IN-51101	9009000005	S056	The Agnostic Science Monitor		Two Denmark Street
0 / 9	IN-51101	9009000006	S056	Weekly Siftings Herald		205 South 26th St
-	FI-52201	9009000185	S820	Cincinnati Federal Savings and Loan		10999 Reed Hartman Hwy
-	FI-52201	9009000186	S085	Them Bank		330 Canton Drive
1 / 4	WH-42301	9009000188	S602	Goldbrick Motorcars		20602 Pascal Way
-	WH-42301	9009000189	S108	Roadville Hybrid Cars		31415 Main Street
0 / 1	FI-52201	9009000370	S897	Last National Bank	N5881034	202 W Main Street
-	FI-52201	9009000371	S299	Second National Bank and Trust		806 Nottingham St.

Core

Review Panel Review Form

Kind	Item #	Explanation

0%

Errors and Warnings View (page 6 in handout)

Surveyor 2007 (WH-42301) - 2007 Economic Census

File Edit View Tools Preferences Help

Check for Software Updates Import from Spreadsheet Export to Spreadsheet Exit

Welcome Inbox Form Workbook Errors / Warnings

Kind	Item #	Explanation	Form ID	CFN	Store/Plant	Name	Name 2	Address	City	State	Zip	EIN	NAIC
------	--------	-------------	---------	-----	-------------	------	--------	---------	------	-------	-----	-----	------

0%

The Software – additional functionality

- **Exporting & Importing**
 - **Exporting**
 - The software creates a spreadsheet containing location addresses and whatever data is within the software at the time of exporting
 - Columns per data field
 - Row per establishment
 - Exporting per form type
 - **Importing**
 - The software “imports” the spreadsheet back in

Outline

- **Background**
 - What is the Economic Census?
 - The software
- **Research**
 - **Timeline**
 - **Findings**
- **Challenges for the future**

Research Timeline

- Early 2003 – Observational visits
 - 2002 Economic Census
- Late 2003 – Debriefing interviews
- 2004 / 2005 – Requirements gathering
 - In preparation for 2007 Economic Census
- 2006 – Usability testing
 - Software prototype

Research Findings

- **Response Process Findings**
(Requirements gathering)
- **Use of Spreadsheets**
(Requirements gathering)
- **Major Design Changes**
(Usability testing)

Response Process Findings

- **Task Analysis**
 - How did you gather the data?
 - How are you searching your records?
 - Who did you work with? How?
 - How does the software assist/hinder with these tasks?
- **Evaluate the software against the tasks that R's were doing**
- **Results of that analysis assisted in the create prototypes that R's then critiqued**

Response Process Findings

- **Respondent Roles**
 - **Coordinators**
 - **Sends the actual instrument (form, software, or spreadsheets) to an LDP**
 - **LDP (Local Data Provider): A data provider within the company who is not the “official” contact.**
 - **Compilers**
 - **Simply request the data from an LDP within the company and complete the paper or electronic form themselves**

Response Process Findings

- Respondent Roles cont.
 - Gatherers
 - Complete the data requested *without* and LDP
 - Receive, Complete, Submit
 - Multiple Roles
 - Gatherer and coordinator/complier
 - Respondents who have access to a subset of the data, but must go to LDPs for the remainder

Use of Spreadsheets

- **Spreadsheets used to:**
 - **Consolidate data**
 - **Gather data**
 - **Compare data**
 - **Verify data**

Use of Spreadsheets *cont.*

Spreadsheets used to: **Consolidate Data**

- Few respondents had access to all of the necessary data to complete an economic census form
- Data was often gathered in pieces and then merged together onto one **consolidated** spreadsheet

Use of Spreadsheets *cont.*

Spreadsheets used to: **Gather Data**

- Coordinators used the spreadsheet to **gather** data from their LDP
 - Send an entire exported spreadsheet to an LDP
 - “fill in the applicable piece”
 - Send applicable spreadsheet pieces to their LDPs

Use of Spreadsheets *cont.*

Spreadsheets used to: **Compare Data**

- Respondents were **comparing** our list of establishments to their list of establishments
 - Identify newly closed or opened locations
 - Mis-matches due to typographical differences

Use of Spreadsheets *cont.*

Spreadsheets used to: **Verify Data**

- Compare reported data to aggregate company totals available in balance sheets and income statements and **verify** that the data was correct (or within a reasonable tolerance)

Research Findings

- Response Process Findings
- Use of Spreadsheets
- Major Design Changes

Design Change #1

New Screens were added
– Workbook View

Workbook View (page 5 in handout)

Surveyor 2007 (WH-42301) - 2007 Economic Census

File Edit View Tools Preferences Help

Check for Software Updates Import from Spreadsheet Export to Spreadsheet Exit

Welcome Inbox Form Workbook Errors / Warnings

Form Types: Store / Blank / CFN: 5758 / 5655463151
Coyote Truck and Auto Services

This is hint #2 for rds:/census_2007/5655463151/RECORD_STORENUM

This is hint #3 for rds:/census_2007/5655463151/RECORD_STORENUM

All Locations - Selected It

FI-52201
IN-51101
RT-44101
WH-42301

146 Kings Grove Ln
Hyndman, PA 15545
EIN: 63-9958936

5758

Errors / Warnings	FORM_MAILER	RECORD_CFN	RECORD_STORE NUM	RECORD_NAME1	RECORD_NAME2	ADDR_STREET
-	RT-44101	2718281827	5758	Leon, the Walking Man's Friend		6207 James Monroe Hwy
0 / 3	IN-51101	2718281828	5056	My Daily Reader		512 Seventh Avenue
-	RT-44101	2718281829	5758	Tricky Richard's Previously Owned Automobiles		1600 13 1/2 Street, NW
-	RT-44101	3246572141	5758	Agamemnon's One Heck of a Car Lot		876 Maple Rd
-	RT-44101	4145611822	5758	Native American Village Motors		4790 W. 16th Street, Suite 5
-	RT-44101	4524587213	5758	Tesla Motors		11950 Potomac River Drive
-	WH-42301	5655463151	5758	Coyote Truck and Auto Services		146 Kings Grove Ln
-	WH-42301	7890123783	5758	Treadwell Porsche		901 E 165 Service Rd S
-	WH-42301	8890658753	5758	Griffin MotoTrux		2010 E Garvey Ave S
2 / 3	FI-52201	9000004296	523	Dewey, Cheatham, and Hu Federal Credit Union	N2299375335	322 Cocteau Court
1 / 4	IN-51101	9009000003		Daily Bugle		450 W 33rd St # 3
-	IN-51101	9009000004	5056	The Seattle Post-Intelligencer		1020 102nd Ave NE
0 / 5	IN-51101	9009000005	5056	The Agnostic Science Monitor		Two Denmark Street
0 / 9	IN-51101	9009000006	5056	Weekly Siftings Herald		205 South 26th St
-	FI-52201	9009000185	5820	Cincinnati Federal Savings and Loan		10999 Reed Hartman Hwy
-	FI-52201	9009000186	5085	Them Bank		330 Canton Drive
1 / 4	WH-42301	9009000188	5602	Goldbrick Motorcars		20602 Pascal Way
-	WH-42301	9009000189	5108	Roadville Hybrid Cars		31415 Main Street
0 / 1	FI-52201	9009000370	5897	Last National Bank	N5881034	202 W Main Street
-	FI-52201	9009000371	5299	Second National Bank and Trust		806 Nottingham St.

Core

Review Panel Review Form

Kind	Item #	Explanation

0%

Design Change #1

New Screens were added

– Workbook View

- Respondents wanted a correctable “quick view” of their data
- Very well received by respondents
 - Large companies
 - » “eyeball” their imported data
 - » quick data changes
 - Medium/small companies
 - » faster data entry
 - » “like using a spreadsheet without having to export”

Design Change #1 cont.

New Screens were added
– **Error and Warning View**

Errors and Warnings View (page 6 in handout)

Surveyor 2007 (WH-42301) - 2007 Economic Census

File Edit View Tools Preferences Help

Check for Software Updates Import from Spreadsheet Export to Spreadsheet Exit

Welcome Inbox Form Workbook Errors / Warnings

Kind	Item #	Explanation	Form ID	CFN	Store/Plant	Name	Name 2	Address	City	State	Zip	EIN	NAIC
------	--------	-------------	---------	-----	-------------	------	--------	---------	------	-------	-----	-----	------

Errors and Warnings View (prototype example)

2005 Report of Organization (MC-33601) - Surveyor 2007 Prototype

File Edit View Tools Preferences Help

Submit Check for Updates Add Location(s) Export Spreadsheet Import Spreadsheet Exit

Inbox Form Workbook Errors and Warnings

Kind	Item #	Explanation	CFN	Store/Pla	Name	Name2	Address	City
Error	1 Employer	Please complete item	2000000001	store1	estab 1		123 Silver Hill	Suitland
Warning	6 E-Commerce	Illogical relationship	2000000002	store2	estab 2		124 Silver Hill	Suitland

? Please complete item

Please Complete Item 1 Employer Identification, Months in Operation.

Design Change #1 cont.

New Screens were added

– Error and Warning View

- In the past, R's could only view errors/warnings form by form
- Now they can view all errors/warnings at one time
 - “eyeball” the problems within their forms
 - sorting allows respondents to pick how they want to resolve their edits (by location or by type of edit)
- Very well received by respondents

Design Change #2

Overhaul of exporting/importing feature

– 2002 experience

- R's had to “map” or link each field on the form to a column on a spreadsheet
 - Allowed R's to build a customized spreadsheet
 - Tedious task
 - Complicated mapping user-interface
 - Once fields were “mapped” they could not be moved or deleted else the import would fail
- Exported spreadsheet was basic
 - Instruction on how to understand and report found in different places (software's Help or on the Business Help Site)

Design Change #2 cont.

Overhaul of exporting/importing feature

2007 experience

- **No more “mapping”**
- **Spreadsheets are more flexible**
 - Respondents can customize by deleting or moving columns
- **More informative spreadsheets**
 - More information within the column to help answer each field
 - Welcome screen
 - » Basic information on how to fill out the spreadsheet
 - » Where to go for more help

Design Change #3

Redesigned Inbox View

- Identified and eliminated columns that weren't useful, or were troublesome, to R's
- Reordered columns to help emphasize more important ones
 - Example: errors and warnings were moved from the far right to the far left
- Added and updated customization options based on response process findings
 - Create Folders (added)
 - Distribute and Collect (updated)

Outline

- **Background**
 - What is the Economic Census?
- **Research**
 - Timeline
 - Findings
 - Response Process Findings
 - 3 Major Findings
- **Challenges for the future**

Challenges for the future

- **Issues R's who are restricted from downloading software onto their work PCs**
- **Helping companies with a diverse response process use Surveyor**
 - **Using our Account Manager Program to help work with these diverse companies**
 - **Giving 'tips' in our mail out package, instructions, Business Help Site**

Using Software to Collect Data Electronically for the Economic Census

Amy E. Anderson
U.S. Census Bureau

amy.e.anderson@census.gov
301-763-7544